

BULLETIN No. 61

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A few years ago appeared a book—"The Seventeen", by E. C. Washburn, that gave the account and adventures of a Baldwin-built locomotive delivered to one of the roads that now make up the present Soo Line. The facts are interestingly related and the book is well worth a place in one's library. In a similar fashion, Mr. Joslyn has related the adventures of the "C. P. Huntington", pioneer locomotive of the Central Pacific and still preserved by the Southern Pacific R. R. Almost daily association together with no little research has produced a well worth while contribution.

Many of our readers will recall the interesting papers submitted by Capt. W. W. Robinson. The present contribution on the Shawmut has been held no little time pending the search for details relative to their early motive power. One blank still exists and if any of our readers can supply the deficiency, we will be glad to have the data.

Additional papers are presented by Mr. Allen, continuing his account of the railroads in the White Mountains and from Mr. Kessler we are including three letters written by Horatio Allen, while in England. Viewed through American eyes, his impressions of the early English railways will be of interest.

For many months, in the seventeen eastern states, the matter of fuel has been one of concern to everyone. The origin of anthracite was given in an interesting paper by Mr. Coughtry before our New York Chapter and we are sure that all of us will find this paper of value.

The location of one of the early strap rails of the Hartford & New Haven R. R. in Meriden, Ct., has given Mr. Snow the opportunity of telling us about that road and the paper by your Editor on Mr. Perrin recounts some of the activities of the Taunton Locomotive Works in Civil War times.

This is the "manifest" of our bulletin and we hope all will enjoy it.

Cover Design

With some of our members the Atlantic type of locomotive may not be as popular with them as some of the other types. We all have our own likes and dislikes and that applies to locomotive types also.

The Atlantic type, like all others, was built to pull the heavier trains the lighter locomotives could not handle. At the time, it was either the 4-4-0 or 4-6-0 types. It was developed at a time when our passenger equipment made the transition from wood construction to that of steel. For that reason, its life was comparatively short. This type was never very popular in New England, about fifty engines saw service here, but on the New York Central; Pennsylvania; Chicago & North Western; Chicago, Milwaukee & St. Paul and others, they were popular and turned in good performance sheets.

On the Pennsylvania R. R., the transition to the Atlantic type was made from the 4-4-0. Improvements were made with each class until this road owned a notable fleet of this type of locomotive. Then came the need for steel equipment and the E-3d locomotives were not capable of handling the same number of cars built of steel as built of wood. In 1907 the Pittsburgh Works of the American Locomotive Co. delivered a locomotive of the Pacific type, classified as K-28, to the Lines West. The Lines East advocated a locomotive of this type with a 26x26" cylinder, Class K-1, none of which were ever built. However, the general design of the K-28 was followed in the Class K-2 which was built to succeed the Atlantic types.

A return to this type came in 1910 with the E-6. Trials were made on the Testing plant at Altoona and in road service both on the Lines East and Lines West. Speeds of 100 miles an hour were obtained but the tonnage carried was not satisfactory. Changes were made, cylinders increased from 22x26" to 23x26" and to 23½x26"—the weight on each driving axle 68000 lbs. was the greatest load placed on an axle on the Pennsylvania. Then the road developed a locomotive that had speed and hauling capacity.

Assigned to the divisions east of Harrisburg, Pa., these locomotives gave wonderful service. On the New York Division it was not unusual

for them to double the division every twenty-four hours—360 miles. They could handle anything on that division and make time and although they are nearly thirty years old, they are still turning in a good performance.

Our artist and member—J. Henderson Barr, has sketched one of these locomotives, ready to make her two hour dash on one of the typical trains of the New York Division and our member—Mr. Paul T. Warner has made an interesting and valuable contribution on this type of locomotive that will appear in our Bulletin #62.

Pennsylvania R. R. Locomotives

In Bulletin No. 58, we announced the completion of a study of the Class D-16 locomotives of this road by one of our members, Mr. Norman J. Perrin. There are still a limited number of these copies on hand that our members can secure by remitting to your Editor the small sum of 20c, dimes or stamps accepted.

Continuing this work, the author announces preparation of the following leaflets:

1. History of the Western New York & Pennsylvania R. R., including a roster 1903-1938 and map of the lines.
2. P. R. R. Light Atlantic classes E-1 to E-5 and E-7 with a list of engines in each class.
3. P. R. R. Pacific Classes K-2 and K-3 with a history, list of engines and their renumberings.

The first leaflet will probably appear this year and the others will follow. All three may be ordered for \$1.00 from Mr. Norman J. Perrin, 4523 Arabia Ave., Baltimore, Maryland.

Illustrations

Under this heading we are going to discuss a suggestion made recently by one of our members.

It seems that upon the publication of our Oklahoma bulletin, one of our members was thoughtful enough to forward to one of the authors a print of a locomotive, which as the author stated would have fitted in very nicely could it have been published. This is not the first time that this has happened and it will probably not be the last that your Editor has received a letter from one of our members to the effect that had the writer known of the publication of a certain article he would have been glad to help out in the matter of prints.

Many of our long time members may remember the efforts of our former Exchange Manager, to have on file with the Society a list of such material as the member wished to file, for this very purpose. A few members sent in some very carefully arranged lists, others simply listed a few of the roads they had negatives of but the majority were indifferent. Possibly they felt it was none of our business what they owned and it probably is none of our business anyway.

However, your Editor has always notified our members as far in advance as possible of the titles of our special bulletins. Such announcements appear in our Annual Report and they have appeared in the last bulletin published during the year. Like everything else, these may be changed but once an announcement has been made, the material will appear sooner or later as in the case of the Oklahoma bulletin that was deferred from last summer.

The make up of our miscellaneous bulletins is one that cannot always be forecast very far in advance. Last minute changes are bound to occur. The authors of these articles either have or locate such photographs as they are able, either with or without our assistance. Generally the same applies to the special bulletins and here the author frequently goes wider afield. In the main, this has worked out fairly well, on the other hand there is no reason why any of our members who have and are willing to loan prints for publication purposes should feel slighted.

Now your Editor cannot forecast what material will appear in the miscellaneous bulletins in 1944 but he can inform you that of the two special bulletins, one will cover the M-K-T System, the other will cover the Philadelphia & Reading. He can also state that some of our members are engaged in research work on the following railroads—Missouri Pacific; Frisco; Southern; Lake Shore & Michigan Southern; Denver & Rio Grande Western; Denver, South Park & Pacific; Atlantic Coast Line subsidiaries and the Western (Mass.) Railroads. There are others in the making that it is impossible how they will shape up right now. Neither is it possible to advise you at this writing when any of the above will be ready. On the other hand, if any individual feels the urge to help in the matter of illustrations he can submit a list of his prints for just this purpose and they will be considered when the time comes.

One thing more and then we will keep quiet—some of you chaps in the mid-west that are interested in the roads in your section, why not turn to and do a little research work. Here are some roads that are more than worthy of your consideration—Chicago & Alton; Cincinnati, Hamilton & Dayton; Monon; Toledo, Peoria & Western; Chicago Great Western; Pittsburgh; Ft. Wayne & Chicago, to name a few. No resident of Chicago can claim a lack of facilities with the many well equipped libraries of that city. At any rate, here is something for you to ruminate over.

For the present we are trying to give you the most number of illustrations and the most number of pages as possible. When the victory has been won we can do better but in the mean time, just think it over!

At Baltimore

Through the kindness of Mr. Robert M. Van Sant, Director of Public Relations of the Baltimore & Ohio R. R., our membership was privileged to receive copies of this booklet of the speech of Mr. R. E. White, President of the Baltimore & Ohio R. R. The extracts from the original records of one hundred years ago make interesting reading in the light of present day affairs. Improvements have been made as shown in the wonderful work the railroads are doing in the present crisis. We are sure that our members appreciate the kindness of Mr. Van Sant in this matter.

Corrections

A few slight errors crept into our Oklahoma bulletin, #60 and we are glad to indicate the corrections below:

Keyes is the proper spelling of that town and there is no "h" to Pittsburg as in our eastern city. Also, the "n" should appear in Hutchinson.

Page 34, line 6, the date should read 1868 instead of 1869.

Page 36, company 54, The Clinton & Oklahoma Western R. R. is now leased to (4) for operation.

Page 40, line 11, amount should be \$920,700.00.

Pages 49 and 63, under the trackage rights, it should be Midland Railroad.

Tablequah and Mountain Park are the proper names on pages 70, line 6 and 71 last line.

In the index the Arkansas Western R. R. should read page 28 and that of the Ft. Smith & Western Ry. on 45-46.

Lastly, the map on page 79, an error was made in marking as abandoned the line from Waurika southwards to the state line. This is the main line of the Rock Island R. R. and is very much in service. The line that was abandoned is the Wichita Valley, line 12, extending from Waurika, southwest to the state line. This abandonment is correctly stated in the text but incorrectly marked on the map on page 79.

On the first page of our Annual Report is found the opening notice of the Cleveland & Columbus R. R. Although this notice was published exactly the same as in the source material, your Editor noted an evident discrepancy at the time of its publication and one of our members, Mr. Clare E. Pierce, also noted it. The train from Cleveland would naturally stand on the north side of the gap—this road runs almost due southwest and northeast. Just what prompted the reporter to state the Cleveland train stood on the south side of the gap will never be known, possibly the celebration went to his head. At any rate, the correct version of an incorrect report can easily be changed by substituting the word north for south on the fourth line.

The Life Story of the Locomotive C. P. Huntington As Told By Itself

PREFACE

Just why a locomotive is always referred to as being of the Feminine gender is a mystery that has never really been explained to my satisfaction. It has long been the custom among railroad men to refer to the locomotive as "she", "old girl", "little old lady", and numerous other names, all of the female gender. Accordingly, in writing this Life Story of the little Central Pacific (later Southern Pacific) locomotive C. P. Huntington—even though the locomotive does have the name of one of the founders of the Central Pacific—and in that same category, nearly all locomotives do have men's names, I shall refer to this locomotive as though it were an elderly lady recounting her life history, or as much of it as she can remember.

As nearly as possible, all names and dates are authentic. They have been checked and double checked, with the exception of the early days at the Danforth Cooke plant. That part is taken from the stories as told to me years ago by old time railroad men at the Sacramento Shops of the Southern Pacific and from the files of old letters and bills that were later destroyed. With this in mind, we will proceed with our history.

D. L. JOSLYN

One day, a few months ago, while indulging in a noontime walk, I strolled over to the park in front of the Southern Pacific Railroad station, where the little locomotive C. P. Huntington now has a permanent home under a rustic redwood shed. I have a great affection for this locomotive, and I also have a habit of addressing an inanimate object for which I have an affection in the same manner as I would address another person. So it was but natural that I should address the little locomotive. I said to her, "Little old girl, you have had a long and honorable career. Many changes have passed before your eye which is not as bright as it once was, but bright never the less, and it would be just wonderful if you could but speak and tell me of the many events in your life—the things that you have seen—the places you have been, and the deeds that you have performed!"

To my great surprise, the little old engine began to tremble all over and in a little puffy voice replied: "It is indeed a great pleasure to me to have you address me in those kind words. I have known you for a great many years, nearly forty years to be exact, and have for a long time wanted to speak to you, but hesitated in doing so. But now that you have broken the ice, to put it in the modern phrase, I will tell you my history, or as much of it as I can remember. You know as well as any one that I am an old lady. I will soon be 80 years old, and while I have a keen recollection of many events in my life, still there are some

events that are rather hazy. But if you will get out your pencil and note book, I'll tell you of my life."

You may be sure, gentle readers, I lost no time, but got my note book and pencil out, and while sitting on the fence that surrounds the little old lady, I took down what she told me. Here is her story:

"I am one of twins, as you know full well, and my twin sister and I were as alike as two peas in a pod. My sister has long since gone to her great reward, but of that I will speak later. To begin, we were born, or as you railroad men would say, we were built at the works of Danforth Cooke and Company in the city of Paterson, State of New Jersey.

I well remember those two men. Mr. Danforth was a rather tall man while Mr. Cooke was shorter and inclined to be stout. While my sister and I were being built, those two gentlemen would come, through the shop, and stop and look over the work with a critical eye, for they were both good mechanics. In the final days of January, 1863 we were finished, and went into the paint shop where some artists worked on us for days, and we finally stood forth with glistening red paint, gold stripes, and polished metal. We felt quite gay in our beautiful new dresses.

Then, for some reason or another, I think it was on account of the folks for whom we were built not having the money to pay for us, we were run out under a shed. This shed had only a roof, and it was drafty and cold out there. Snow would drift in under the roof, and my sister and self were quite miserable, especially as we heard some of the men say we were dead heads on the hands of the firm. This made us sad, as we did not want to be dead heads.

After we had been there for several weeks, it might have been longer, some men came out there one day, and one of the men was telling of having enlisted in some war that was going on. He asked his companion to keep a good look out for Dora and see that she did not want for anything, and then asked, "When are you going to enlist, Harry?" Then they got to talking about the little locomotives and what Danforth Cooke and Co. intended doing with them. This, of course, was us that they were talking about. Harry spoke up and said, "Well, it is more than likely the army will buy them as the army needs locomotives." Then the men went away.

Things went from bad to worse. We were getting dirty. Some rust had set in, and we were surely down in the mouth. When we had about given up all hope, some men in army uniforms came out there with Mr. Danforth and looked us over carefully. These army men asked a lot of questions about horse power, size of cylinders, and a lot of other stuff that we did not understand. Mr. Danforth told these men in uniform that some one whom he called "The Government" could have the two locomotives, meaning us, of course, for ten thousand dollars each. But the men in uniform said no, and explained that the locomotives were too small.

Shortly after this, Mr. Cooke came out there with a stout round faced man, a real good looking man with a beautiful beard, and this man

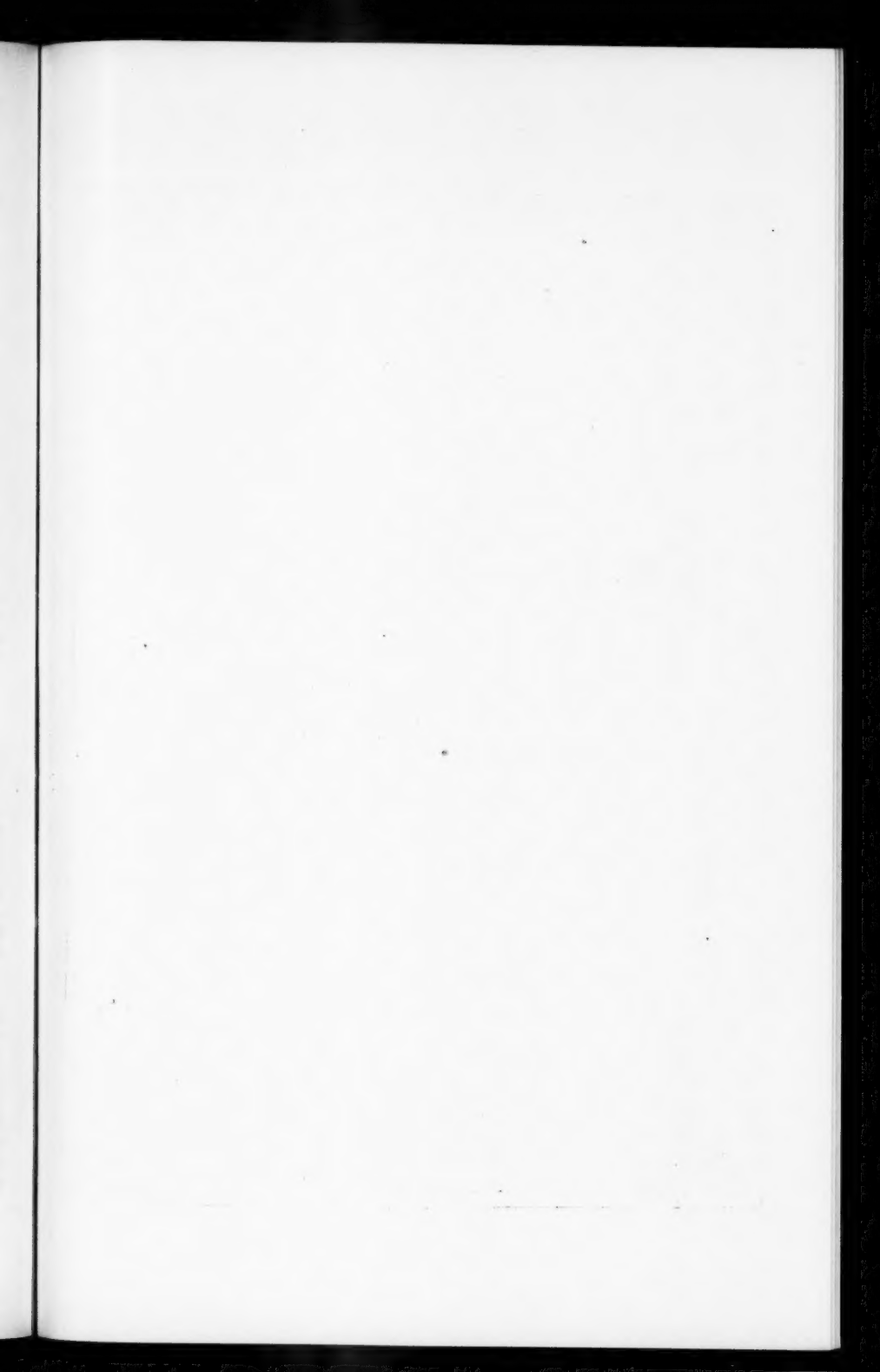
looked us over and asked the same old questions about size of cylinders, weight, and so forth. Then he said, "Well, Mr. Cooke, the engines are rather small, but we are badly in need of locomotives out there in California, and I'll take the two of them at the price your partner quoted me in his recent letter." "Very well, Mr. Huntington," replied Mr. Cooke, "let us go in the counting house and make out the papers." So that was Mr. Huntington from California, I said to my sister, and just think of that, we are going way out there to that wonderful country of which we have heard so much. We could hardly contain ourselves, and when that little wheezy, coal smoky, busy-body of a shop goat bumped into us and hauled us back into the paint shop, I forgot to be mad at her.

Those artists went right to work on us, and we found that we had the lettering "C. P. R.R. of Calif." on our tanks, and my number was 3, and my sister's 4. I had the name "C. P. Huntington" lettered on my cab, and my sister had "T. D. Judah" on hers.

Young man, I can tell you this, that was nearly 80 years ago, but I remember it as well as if it were yesterday. We could hardly sleep for the excitement of our trip to California. The next day or so were busy ones for us. Our stacks were taken off and placed in packing boxes, as were also our bells and main rods. Oil was wiped all over parts where rust might set in, and then that huzzy of a shop goat bumped into us again, and we were whisked down to a wharf where I could see two graceful boats at the dock. One had the name "Success" on her, and the other had the name "Mary Robinson". They were surely nice looking boats.

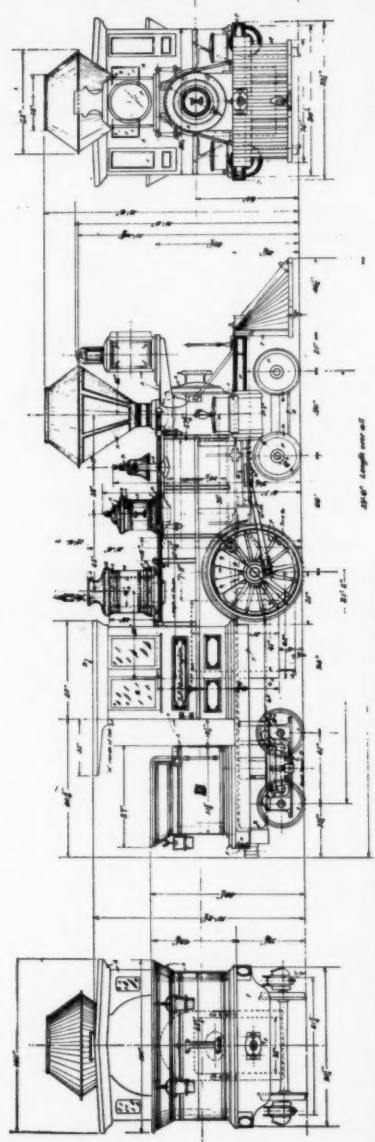
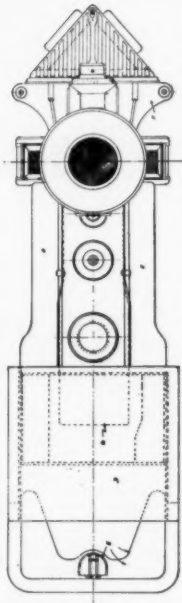
There was great excitement here on the wharf. Men were running back and forth with hand trucks loaded with boxes, kegs, bundles, and casks. Huge drays, to which were harnessed 4 and 6 horses, were coming and going, backing up, turning round, and getting into places where I was sure they would never get out of again, but they always did. Some big ropes were then placed around me and before I knew what was going on, I was high in the air over the dark water, and my, how I did hang on as I was really scared they would drop me in the water, but in a few minutes I was sitting safe and sound on the deck of the "Success" and was surrounded with boxes, bolts, rail fastenings, rails and machinery. A great big piece of sail cloth was placed over me and I could not see what was going on.

Pretty soon I could feel the boat moving and knew that some pesky little tugs were towing the "Success" out to sea. Then I heard a great noise and bustle, and some deep voiced man saying, "Hoist away, me hearties, avast you lubbers, belay all," and such terms as I did not know the meaning of. Then the "Success" began to roll and toss and the rain came down in torrents, and though I hate to admit it, I was really sick, for I knew full well that we were out on the great ocean far from land, and there were smells coming from somewhere that did not smell pleasant to me. Then I got to thinking, this great boat has been many times to sea and has made several trips to California, and I knew I had nothing to fear—so dropped off to sleep.



Color Scheme

1. Body - Black
2. Smokestack - Black
3. Cab - Black
4. Wheels - Black
5. Piston Rods - Black
6. Piston Pins - Black
7. Piston Rings - Black
8. Piston Skirts - Black
9. Piston Skirt Pins - Black
10. Piston Skirt Rings - Black
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95. Piston Skirt Pins - Black
96. Piston Skirt Rings - Black
97. Piston Skirt Pins - Black
98. Piston Skirt Rings - Black
99. Piston Skirt Pins - Black
100. Piston Skirt Rings - Black



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Scale	1/4" = 1'
Sheet No.	1000
Drawing No.	1000
Sheet Title	Locomotive
Sheet Date	1910
Sheet Author	C. P. Huntington
Sheet Engineer	C. P. Huntington
Sheet Designer	C. P. Huntington
Sheet Checker	C. P. Huntington
Sheet Approver	C. P. Huntington
Sheet Date	1910
Sheet Author	C. P. Huntington
Sheet Engineer	C. P. Huntington
Sheet Designer	C. P. Huntington
Sheet Checker	C. P. Huntington
Sheet Approver	C. P. Huntington

SOUTHERN PACIFIC COMPANY
SACRAMENTO, CALIF.
Diagram and Detail
Locomotive

Sheet No.	1000
Sheet Title	Locomotive
Sheet Date	1910
Sheet Author	C. P. Huntington
Sheet Engineer	C. P. Huntington
Sheet Designer	C. P. Huntington
Sheet Checker	C. P. Huntington
Sheet Approver	C. P. Huntington

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After we had been to sea many days and I was getting used to the rolling and tossing of the boat, the wind came up with violence, and the boat would seem to stand on end, then come down with a crash, and the noise was terrific, besides, salt water would roll over the deck and I was all wet with ocean water. Finally one great gust of wind tore the sail cloth off me, and I could look around. I was horrified at the sight that met my eye. Our beautiful white sails were torn to shreds. Great waves of green water were rolling right over the side and onto our boat. Men were clinging to anything they could hold on to. There was our brave captain up on the poop deck with the man who was steering our boat, and that captain looked so brave and strong that I forgot my fright for a moment.

That night the wind went down and the boat rode easier than any time since we left the dock. In the morning the sun came out bright as we sailed along, far from land. The sea looked calm and peaceful. The men were mending the sails, and I heard the captain tell his mate that it was the worst storm he had ever witnessed in rounding the "Horn". So that was Cape Horn of which I had heard so much. I should like to have seen that place but on account of the storm and rain, I could see nothing. Well, from then on, the weather was nice, the days were warmer, even the nights were not so cold, and the stars came out so pretty at night—it was really a beautiful sight. After many days, we could see land, and some one said that it was California. Then we rounded some rocks and came in through a narrow pass, and the men said that was the Golden Gate, although I could see neither the gold or any gate. Pretty soon some tugs came out to meet us, and there was a small boat came along side and we took on a pilot.

The men said he was a pilot, but he was so wrapped up with coats and a huge hat was on his head, that I could not tell what he was. We were soon at the dock, but it was getting dark at that time and I could not see what sort of a place this California was.

In the morning, I was all eyes to see where we were, and some one said, "This is San Francisco." Well, I could not see much of a town, just a few houses, not very much of a dock, and look as I would, I could not see any sign of tracks, and I was commencing to wonder where I was to go to work. Then the "Mary Robinson" came in alongside of us and there was my sister as big as life on the deck of that boat. I had wondered what had become of her. Soon the big ropes were placed around me, and I was high in the air again over the water, but shortly found myself on the wharf with my sister, and all the stuff that had come on those two big boats.

We stayed there on that wharf for a number of days while some fierce men with guns guarded us night and day, and I could not understand all this. Then one day a kind of wagon, that men called a surrey, hauled by two horses, came down to the wharf and a couple of men got out and walked over to the small shed near where we were sitting. Both of these men had some canvas bags with them, and those bags looked heavy to me. One of these men was rather tall, and walked very slow

and deliberate. Then our captain, and the captain of the "Mary Robinson" went into the little house with the two men, and we could hear money being counted. Presently our captain came out with the tall man and said, "All right, Mr. Hopkins, the amount of \$12,781.44 is quite correct. You may now remove your property." Then the captain called the fierce men with the guns, and they all got into a hack and went away.

Soon some river boats came along side the wharf and I found myself on the one called "Pet" and she was quite a gossip. Gave me all the news that I wanted to hear. Said we were going up the river to a place called "Sacramento" where they were building the railroad, and that it would take us three or four days to get up there. My sister was loaded on the "P. A. Owens", and in four days more we were at the mud banks at Sacramento. A couple of big timbers were fastened to a place on the bank, and one end was fastened to the deck of the Pet. Then a big thing called a snatch block was fastened to the side of the Pet, and a huge chain was fastened to my front draw head and some of the queerest looking animals I had ever seen were fastened to the other end of the chain. The Pet told me these were oxen and that they were very strong, and were patient animals and it was a shame the way men made these oxen work.

Soon some rough looking men with big whips in their hands began to shout and holler and crack these whips over the oxen, and more shame to them, they cracked the whips along the flanks of the poor animals, and I found myself moving along those big beams and was rather scared as the beams creaked and groaned. Then, just as I got to the top of the levee, a most terrific explosion took place. Men tossed their hats in the air and hollered; and the explosion shook the earth again.

I was now really scared, and the poor oxen were too. They started to go in every direction, when a big powerful man with a nice glossy beard came out of somewhere with a big pistol in his hand. He shouted, "Hey you so and so of a such and such Captain Siddons, stop that infernal cannon of yours before I blow you into Kingdom come!" And you bet, that gun did not go off again. Then this big man started to yell at the men, "Come on, you loafers, get this locomotive on the tracks! What am I paying you for? What are you waiting for? Move up, or I'll dang soon move you!"

Then he calmed down and started to laugh, and Mr. Siddons came over and said, "Mr. Crocker, I am sorry that I scared your oxen, but this is quite an event—new locomotives for the Pacific Railroad—and you know I always shoot my cannon when an event happens in Sacramento." So Captain Siddons, who ran a saloon on Front street, with a lodging house upstairs over the saloon, shook hands with Mr. Chas. Crocker, the oxen quit trying to go different ways, and I soon found myself on the tracks on the levee.

Then a locomotive that was standing down the track a little ways came over and dragged me down the track near a place called the Police Station, and there was a small shed there with a few tools in it; no

sign of any kind of shops. This locomotive had number 1 on her smoke box, and "Gov. Stanford" on her cab. She told me she was the first engine to come to Sacramento for the Central Pacific R. R. and had come here in 1863, and had been working right along except for a short time when the men had changed her gauge from five feet to four feet, eight and one half inches. She said that there was another locomotive The "Pacific," which had just come a few months before I came, and that she was out at 17th and B street with some rails. Said she would be back shortly, and she came along while we were talking.

Then Mr. Crocker came along with another man whom he called Mr. Goss, and Mr. Crocker rather riled me up as he said to Mr. Goss, "What in h— are we to do with this little two by four engine? But you had better get her fixed up right away, for even though she is small, we can use her." While Mr. Crocker was talking to Mr. Goss, an odd looking locomotive, with the funniest looking pilot you ever saw, came along side of where we were. The Stanford told me that it was the "Sacramento" of the Sacramento Valley Railroad, and had been running from Sacramento to Folsom for a number of years, and that she had a sister named the "Nevada," and they two had two half sisters called "L. L. Robinson" and "C. K. Garrison" running on the same line. These engines of the Sacramento Valley Railroad were soon very chummy with me, but I never could get used to the huge bonnet stacks that they had.

While we were talking, my sister was taken off the "P. A. Owens" and the men were busy putting my stack on, getting the rods in place, and I was supposed to go out on trial the next day, but a leak in my boiler held me up until the 9th of April, 1864, and my sister got away first, although her number was 4, while mine was 3. But I was soon ready, and on the 9th of April a man by the name of Lonnergan was told to take me out on the line. I'll never forget that day as long as I live. We went over across the slough on a narrow creaky trestle, and then along the levee out to where the men were just finishing the bridge across the American River. When we got out there, Mr. Alfred Hart, an artist, took a picture of me on the trestle that was in front of the bridge. I had to stand still for forty seconds while the picture was being taken, and then when I finally saw that picture I was disgusted as Mr. Hart had not got me all in the picture. That was many years ago; but just a few days ago I saw one of those pictures in a magazine that a woman was looking at while she sat right there where you are. It made me laugh, because the magazine had some print under my picture, and it said, "One of the original transcontinental locomotives of the old Central Pacific R. R." Those magazine fellows are funny, and now then, Mr. Joslyn, don't you make any mistake like that, will you?

The very next day I went right to work and Mr. Lonnergan was to be my engineer. Two or three platform cars—you call them flat cars—loaded with rails were attached to my tender, and I proudly drew those cars out to end of track where the men quickly put them in place, and I was soon running over those tracks in my daily work. Those men

worked fast, and you bet you would work fast too if you had a big strong man like Mr. Crocker for boss. But I liked him, and he would get up in the cab and ride out to work with us in the morning. He had a terrific voice, you could hear him a long ways off, but he was real handsome, and could be very kind. Mr. Crocker and my engineer were great friends, and got along nicely.

I remember when we got out to a place called "Griders" where our railroad crossed the California Central Railroad. We used to see a wheezy little eight wheeler coming along with a box car and one passenger car going from Folsom to Lincoln. This snip of an engine, called the "Harry Wilson," turned her nose up the first time she saw me and made the wise crack, "Well, well, see Pee Wee! Where did you come from?" I simply tossed my nose in the air and ignored the hussy, and I can tell you it was not long afterwards that this little cat of an engine was brought in and had her name changed to "Oronoco," and shortly after that I saw her remains in a scrap pile, where she had been broken up. Served her right!

The men were building a new station at Griders, and when it was finished I saw that the name was changed to "Junction," and the Stanford, who was a regular gossip and found out everything that was going on, told me the men had changed the name to Junction as it was the junction with the California Central, and that the Central Pacific had bought the road and would stop running from Folsom to Lincoln, and sure enough, that is just what happened. I understand they afterwards changed the name of the station to "Roseville," but you would know more about that than I would.

Well, we kept working away, day after day, and soon we had the track built to Rocklin, and I could see the men busy building a nice round house out of granite, but they were putting a wooden roof on the round house, and the Stanford said that they could not put a granite roof on, it would be too heavy. I would not know.

Well, out there at Rocklin the whole country seemed to be granite and rocks; but there were some trees. Then we came to a place called "Griffith's Granite Station." I think afterwards that was changed to "Penryn," and just before we came to that station, the men put up another station and called it "Pino," because there were some tall pines growing there. I think you call that Loomis now.

We were getting right up in the hills now, and it was getting harder and harder for me to get up there with two cars of rails, so we would take three cars to Rocklin, and then leave two cars and take one to end of track and then come back for another. Mr. Crocker said that was too slow and he hoped they would hurry up and get some of those big engines out here that Mr. Huntington had promised. Well, one day as we got back to Sacramento, I could hear Captain Siddon's cannon; he called it Union Boy, booming for all it was worth, and the Stanford, with Hank Small as engineer, was shrieking her whistle, and Mr. Lonnergan did not know what it was all about, but he set my whistle to shrieking until my ears nearly split. When we got to the levee down by the river

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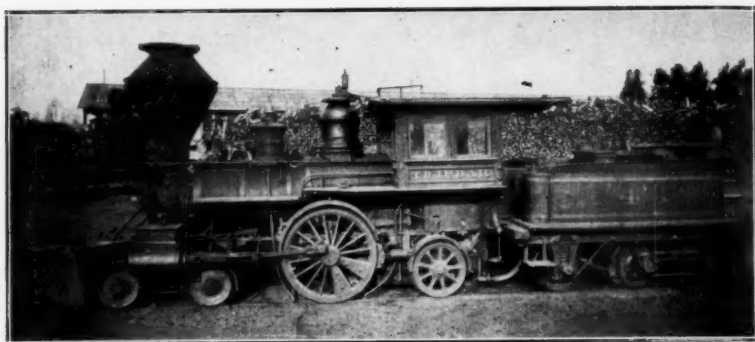
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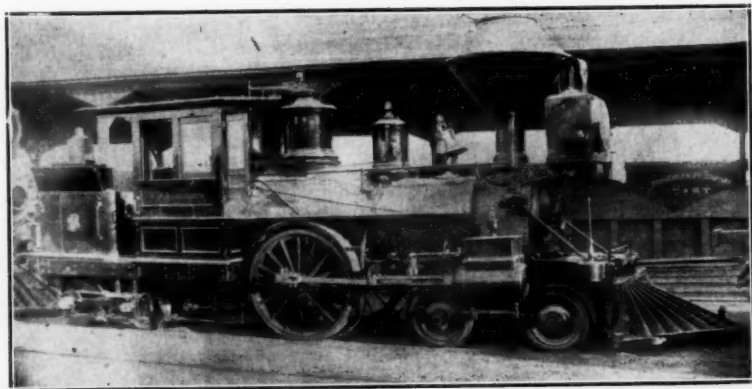
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—Courtesy of D. L. Joslyn.

Let me introduce my sister, "T. D. Judah," built in 1863, by Danforth Cook & Co.



The way I looked at the time of the World's Fair, Sacramento, 1892.

we found that a couple of boats had arrived with two more locomotives, the 5 and 6. And say, that 6 spot was the biggest locomotive that I had ever seen. She had six driver wheels, and had cylinders 17x24, and she was a big thing, all right. No wonder the men yelled, and the cannon boomed! I was given the job to haul this new engine down to the shed where the men would finish getting her ready for work. It was all I could do to get that engine moving, but we finally got to the shed, and I was all out of breath. A few days later the men had her ready to go to work, and she had the name "Conness" on her cab, and the Stanford said that was in honor of Senator Conness. This big engine was not a bit stuck up, but greeted me nicely, and thanked me for the lift I had given her.

Just then a whole big lot of men, including all the city trustees and a lot of state officers, came down there to Front street and got on the Conness and sat all over the tender, and in the cab, and along the running board—why you could hardly see the engine. They had a whole lot of bottles, and some big baskets, and the Stanford told me that there was a fizzy kind of wine in those bottles and a whole banquet in the baskets. I guess there was a "fiery" kind of wine in those bottles, because when the Conness came back a few hours later, a lot of those men acted kind of queer and could not stand up straight.

The Conness and myself were always very good friends, and I felt badly when the news came to me in 1908 that she had at last been scrapped. Some one told me at that time that her last work was hauling an outfit train from place to place.

About this time, it was in 1865, I think, that I met a man whom I afterwards learned was a very bright man. I liked him from the very start, and on that very same day I met Governor Stanford for the first time. I had seen the Governor several times, but had never met him face to face. Well, we were puffing along Front street with two cars of rails when the Conness came along with ten cars of rails. Imagine that! Ten full cars! We had to back into a siding to let the Conness go by. I was rather upset about this, and so was Mr. Lonnergan, and when we started to pull out of the siding I kicked up a big fuss and my drivers spun around and shot fire out at the rails. Just then a spirited team of bay horses attached to a fine sulky came around the corner of "J" street, and when those horses saw me and the fuss I was making, they just reared up on their hind legs, and snorted, and started to back up. Well, there was a handsome man with a nice bunch of whiskers on his face, oh he was a handsome man I can tell you, and he just sat there in the sulky and talked to his horses and held the lines tight, and then told Mr. Lonnergan to get that engine away quietly. We got out of there in a hurry! As we were going on down Front street, all excited about scaring Mr. Stanford's horses, a man who was walking along the tracks held up his hand and we stopped. He got into the cab with Mr. Lonnergan and said, "Run her out a little." Well, we did not know what he meant, but we ran up and down a few times, and then Mr. Stoddard, for that is who it was, said, "Those Cooke people did

not do a very good job on those valves on this engine, seems to me that they are badly worn or else there are no balance plates. I think we will take her to the shops and see what is wrong."

Just then Mr. Stanford came up and shook hands with Mr. Stoddard and asked what was wrong. Mr. Stoddard told him what was wrong, and Mr. Stanford said, "All right, George, you go right ahead and fix up those engines as fast as you can, as there is plenty of work for them to do." So the next day I did not go to work, but the Atlantic took me over to the new shops at 6th and E streets, and some men took the covers off my valves, and sure enough, there were no balance plates, and the valves were so badly worn the steam could not do its full work. Mr. Stoddard came and made some sketches, and then made some new drawings, and Mr. Benj. Welch made a new pattern for some valves and balance plates, and when those were put in I could do twice as much work. I forgot to mention, those new parts were cast at Eye street where Mr. Baxter was in charge, and he was what you would call stout, but in those days we called a spade a spade, and we said he was fat.

With my new valves I found I could get up to Newcastle nicely, and haul three cars at that! Of course you must know that those flat cars were not the huge steel things that you have now. Those cars only held fifteen tons and they were all made of wood; even a part of the trucks were wood. Those cars were just my size, and with my help, and the help of a lot of other engines, we hauled all the material to end of track and built the road.

After we got to Illinois Town, you folks know it as Colfax, Mr. Crocker decided that I was too small for the hills, and it was getting me down to get up there, so I just went to work switching around the yards at Sacramento; and those yards were getting bigger and bigger all the time. Mr. Benj. Crocker, who was a brother to Charles Crocker, had a whole lot of men with horses and big wagons come down to the river, and they just hauled dirt out of the river bank all day long for months. That dirt was dumped into the slough, and before we knew it, some nice brick buildings were being built on that dirt. You may make fun of the way they did things in those days, but they did do them, and with what they had to work with, they did them well. Picks and shovels, wheel barrows, horses and wagons; that was all they had, but they did a lot of work with those tools and those horses.

Then came my big day! I was elected to haul the first train on the Western Pacific to Stockton. I had a nice engineer named Brown, and he had such nice curly hair, and such black whiskers. He came over and patted me on the side and said, "Young Lady, you have a big job ahead of you, now don't let's fall down." I think that he did not think much of me because I was so small, but I decided to show him I could haul that train, and I did, and we made good time. Mr. Brown was tickled with that trip and asked to have me all the time on that run, but I was taken off after a few trips and was sent to Folsom with one baggage car and one passenger car. I had that run for a while, then was

sent to Lincoln on a train that went up there every day. We would go out to Junction and then switch off and go over the only tracks left of the old California Central, and on up to Lincoln, where there was a big pottery, which is still there.

But I seem to be getting ahead of my story, so will go back to 1865. As you may know, I have told you of some things that happened in 1869. Well, one day in 1865, I think it was in March, I know the day was raw and cold, anyway, we were waiting with one baggage car and a passenger car for the fast steamer "Chrysopolis" to come in from San Francisco, as we had passengers and mail for Folsom to take off that boat. Pretty soon the boat came in and the Pony Express rider was there and grabbed a couple of bags of mail, and was away on his sorrel filly like a shot. You should see that horse go up "J" street kicking mud off her heels and striking fire from the rocks that were in the mud. She was out of sight in a minute.

Then my attention was called to a boy who had gotten off the boat and was looking around sort of lost like. Mr. Strobbridge, one of the construction Supts. of the C. P., walked up to the lad and said, "You seem to be lost, young man, is there anything that I can do to help you?" "Why yes," replied the lad, "I am looking for a boss of the Central Pacific Railroad. I understand they need men, and I want a job." Well, Mr. Strobbridge laughed at this, but said, "If you really want a job, I'll give you one, as my engineers need an active boy to carry things, and drive stakes. So you just run on around there to the Western Hotel on "K" street and tell Mr. Land that I sent you. Get a good night's rest, eat a hearty meal, and be on hand at six o'clock in the morning as we leave at that time." Well, that young man was there on time, and he said to Mr. Strobbridge, "I hope this job lasts!" Well, it did, for Mr. Joel Osgood Wilder, who was the lad, began service with the Central Pacific that cold blustery day in March 1865, and when he retired from service he had worked 55 years for the Central Pacific and Southern Pacific. So the job did last. Mr. Wilder died in 1937 and I was terribly sorry that I could not go to his funeral, as he and I were fast friends all the years that Mr. Wilder worked for the company.

Boats began to come in faster and faster with all kinds of material for the railroad, and so many new engines came along that I lost track of them. They would go out on the line and some of them we never saw again. The men had fixed up a new way to get the engines off the boat and the oxen were no longer needed for that purpose. But Captain Siddons never lost sight of the engines that came, and kept his noisy cannon booming every time an engine came in.

I did not see much of Mr. Crocker any more, as he was way up in the mountains, and had a new kind of men working for him: The men called them "Chinamen," and they were queer looking men to us. The first time I saw them I thought they were women as they had long hair and wore jackets that looked like short skirts. Those jackets only came down to their knees, and they wore slippers and big round basket like hats. They carried their clothes in other basket sort of things suspended from poles across their shoulders. They wore very baggy pantaloons and

had them tight around their ankles, and they wore slippers—no shoes. I could not understand a word they said, but they were very patient men, and I learned that they were good workmen, but had to have gallons of cold tea to drink, and that they would not eat any beef or mutton, only pork, rice, cabbage, fish and chickens. They smoked little pipes with long stems, and their tobacco smelled very funny to us. I remember with pleasure one of the fresh men at the shop on the levee, he was always doing something or other, well, he stole some of the tobacco from the Chinamen and put it in his pipe and smoked it. It made me laugh with glee when that man got sick and nearly died from that tobacco. The Chinamen laughed and one said, "Him no savvy smokem China Boy tobacco; him no good."

One day the men brought the Sacramento Valley engine "Nevada" into the shops and took the wheels out and placed the engine on a platform car. I learned afterwards it was taken to Summit and used to help build the tunnel up there, and we never saw the Nevada again.

As I sit here telling you my life story, there are events come back to me that I had quite forgotten. One day a tall, quiet, soft spoken man came along with Mr. Stoddard, and I met Mr. Andrew Jackson Stevens for the first time. He was so soft spoken, and so quiet; I liked him right away. He had a habit of standing with his hands in his pantaloons pockets. The men in those days had their pockets straight down, not at the side like now. Well, Mr. Stevens came along one day looking at some engines that had been sent back from end of track because they were worn out, and he had his hands in his pockets, and he said, "George," (that was Mr. Stoddard, of course) "George, I think we can rebuild these engines to get more work out of them. I don't think they have been built to any plans, just put together from old ideas. Suppose you get after them." Then Mr. Stoddard, and Mr. Gerrish, who was the machine shop foreman, went right to work and rebuilt those engines, and when they were done with them, say, they could pull twice as much as before. Mr. Gerrish was a fine mechanic and he could get things done in a hurry when he went after it. I liked him very much indeed. He built the first all brick house in Sacramento, and planted the first orange tree in Sacramento, and I remember when he was telling Mr. Stevens about planting that orange tree, the men laughed at him and said that oranges would not grow here. But that tree did grow, and is still bearing oranges, and that brick house is still standing out there on "G" street. Some folks don't know everything.

One day my engineer got orders to take me around to the shops on "E" street, and we hooked onto the funniest looking thing I ever saw. It had a big shovel-like front on it, and some said it was a snow plow, and that Mr. Welch had made the thing from his own ideas. I heard one of the men say, "It will take more than the three spot (meaning me, of course) to push that plow through the snow." Well, maybe it would, but I did not want to push the snow off the tracks. I wanted to stay right down here in the valley. No cold mountains for me! Burr! Burr! I still think of that shed there in Patterson where my sister and I stood for so long, with snow all over us.

Then one day we got word that the railroad was built all the way to Ogden, and that the Union Pacific had finished their end of the line from the East to Ogden. Then we had a gala day. That was on the 10th of May in 1869, and I can remember that day as well as if it were yesterday, although nearly all the folks that were here then are gone. Not even one of the engines that were present that day are here now and I feel sort of lone and lorn. But to continue; We had one huge parade that day, and first it was intended to take my sister and self up town on the horse car tracks, but Mr. Stevens said, "No, our wheels would not go on those tracks, and we would derail." That sort of made me sad, then I cheered up when I found that the parade would come down Front street, and we would be right there where we could see the whole thing.

Mr. Wheeler was Grand Marshal of the parade, and he had a beautiful black horse with a new saddle, all trimmed in silver. Mr. Wheeler had on striped pantaloons, a yellow vest with flowers on it, and he wore a long black coat, and a new silk top hat. Someone said that the hat cost one hundred dollars, and I guess it did, all right. The marshal had a beautiful sash across his shoulders and he looked just grand.

Behind the marshal was the chief of police, Mr. John McClintock, and he had a nice new uniform and a new silver star, and he was riding on a beautiful horse. His men all had new uniforms and they were surely nice looking, and those men stepped along so grand. Then there was the Sacramento Union Brass Band, and they were playing "Wait for the Wagon" when they passed us. I felt sorry for the man blowing the big horn; he was a little fellow, very fat, and he was just sweating for all he was worth.

Next was the Fire Department with nice new red shirts and dark blue pantaloons, and the chief was in a new buggy all painted bright red, and his uniform was brand new, and he had a big helmet on his head, and I think that helmet must have been very heavy from the way he kept shifting it. The fire chief was Frank Johnson, and he was a handsome fellow. All his fire department was behind him, and the men had to pull their own pumpers and hose carts. They did not have any steam fire engines in those days, and no horses to pull the fire department. The men pulled them with long ropes, and they had those ropes all decorated with flowers, and had flowers all over their pumpers and hose carts.

There were bands from Folsom, Stockton, Woodland, Maryville, Davisville, and all round these parts. Good bands, too, and they were not afraid to play, I can tell you. Then there were the firemen and their equipment from all the towns around here, and I often wondered what would have happened if a fire had started in one of those towns when all their fire department was in that parade at Sacramento.

Then there was the National Guard, the Sacramento Hussars, the Sacramento Cadets, The Washington Rifles, and oh dear, I could not tell you all the different organizations in that parade. There were some grand floats, and everything was so nice. If I live to be 100 years old,

I'll never see another parade as grand as that one, and I have taken part in a good many parades myself; and all the time Captain Siddons was booming his Union Boy until it got so hot he could not load it any more. The church bells were all ringing, the fire bells were ringing, and all the locomotives in the yards had their whistle cords tied down so that they just kept up in a din fit to split one's ears. That night, after dark, we had some of the grandest fire works you ever saw, and I saw them all.

Well do I remember when the special train returned from Promontory with Governor Stanford and the other men on board. The locomotive Antelope pulled the train in, and there were two new passenger cars in that train. The first cars ever to come all the way overland. They were built by Wasson Manufacturing Company in the east, and they were elegant cars. They were painted and varnished a deep yellow color, with the name "Central Pacific R. R. of California" on the letter board, all put on with real gold leaf, no make belief stuff. They had the new style 'Creamer' brakes, and the seats were finished in a bright red plush. There was a new style stove in those cars, too. The stove had a long box-like thing that went down the sides of the car, and carried the heat all the way along by the seats. When I hooked on to those cars, they just rolled along so nice and easy.

Well, you may be sure, after the railroad was finished, and the trains began to come from the east, we were certainly busy. Train after train of folks kept coming, and just hundreds of cars of freight. The Stanford, my sister, and myself were busy from early dawn to late at night getting those cars switched, and trains made up.

Every hotel in town was full of visitors; the Western, Hull House, Ebeners, Union, What Cheer, Mansion House, Golden Eagle, and dear me, I forget the rest of the hotels, but there were more. Mr. Welch, the Master Car Builder, was busy with his men making new cars as fast as he could, and still there were not enough, and we had to borrow some from the other railroads. They would come right on past Ogden, and bring the freight right to Front street, where we would switch them to the river, and then the freight was loaded on river boats and sent to San Francisco; that is, all but what stayed here in town.

But I must tell you of the happenings when the California Pacific came to town. They made the old bridge across the Sacramento strong enough to haul their trains over, and got everything ready. Then one day their little eight wheeler engine named "Marysville" came across the bridge with three passenger cars full of folks; but our railroad would not let them cross our tracks, and kept the locomotive Pacific going back and forth in front of the Cal. P. tracks, so that they had to back up and unload their passengers on the Yolo side of the river, and let them walk into town, and those passengers were surely mad.

But after awhile everything was fixed up again, and the Cal. P. came across our tracks, and we did not stop them. Their train went down along side of the old slough and unloaded their passengers there. Afterwards, when our road bought the Cal. P., we built a new station there, which was torn down just a few years ago. It was a fine station, I

know, for I was in it many times. The roof was all over the tracks, and we could get out of the rain by going in under it, which we did.

Our trains would come from the east, stop at the depot on Front street, and then our passengers would get off and board the fast river steamer Chrysopolis, or the Amelia, or the Julia, or perhaps the Enterprise; and there was a new boat called the "Chin Du Wan," and some said that was a Chinese name, but I did not know for sure. The Stanford told me that the Chin Du Wan was a very beautiful boat inside; that there were some nice rooms on it, and that the meals were as fine as could be gotten anywhere. She was fast, too; almost as fast as the Chrysopolis. The Chin Du Wan had a caliope attached to her boiler, and when she would get about a mile away from the wharf at Sacramento, she would start to play tunes on that caliope, and then all the folks would know that she was coming. That music sounded sweet on the river, I can tell you! There was a little woman, I can not recall her name now, who used to play that caliope, and how any one so small as she, could make all those whistles blow so nice and sweet, was more than I could tell. Sometimes our passengers would get on the Cal. P. cars and go to Vallejo, where there was a fast boat called the "New World," which would take them to San Francisco.

I remember one day we got word that some vile person had shot our good, kind President, and when he died, we all had crepe on our cabs for a long time. Some of the engines had seen Mr. Lincoln and said he was a very nice man, and that he was interested in locomotives and would go and look them over and get up into the cab whenever he could.

I continued to switch around the station and yards, helping my sister and the Stanford, and then sometimes in the Spring I would haul excursion trains out to Arcade Station, as you know it, but we called it Dry Creek Depot; and many an excursion did I haul out to Richmond Grove at 21st and "R" street, and at other times I would take a train up to Folsom, for they kept me busy all the time.

Then one day the Stanford told me that the Western Pacific had been finished to San Jose, and a branch ran into a place called Melrose, where it connected with the San Francisco and Oakland R. R., and that trains would soon be running right through to Alameda Wharf, and would run to Oakland Wharf just as soon as the tracks could be ready for them.

It was, I think, in December 1869 that I got orders to go over to the shops and get a car and bring it round to the depot. My engineer and I went across the long trestle on the old slough, over to the new shops where we found a nice new car numbered 7, and with the words "Directors Car" on the sides. I thought the car was new but the Stanford said no, it was one of the cars from the California Central R. R., which had quit running trains, and that the men had made it all over to look like new. It was a grand car, all right, and my engineer got orders to take me and haul that car right down to Alameda. Well, Mr. Stanford, Mr. Crocker, Mr. Huntington, Mr. Goodman, Mr. Stevens, Mr. Strong, and several other men whom I found out were state officials,

got in the car and away we went. We stopped for a few minutes at Stockton, then kept going until we came to a place called Lathrop, where the men were building a new round house and a nice big hotel.

After a little while we came to some pretty steep hills and it was about all I could do to get that car up them. We were burning oak wood, not the nice white pine like we had at Sacramento, and the oak did not seem to burn very good. My fireman would stir up the fire, and then put in some more wood, until soon my fire box was chuck full. Then the oak started to burn, and it kept getting hotter and hotter and my safety valve was just screaming, it was blowing off so hard. I thought I was going to melt. Pretty soon we got to Alameda, and that fire was still burning hotter than any fire I had ever had. My engineer had to keep running me up and down the track in order that the feed water pump might keep going to keep water in my boiler. Soon the fire burned out, and we were all right again.

Then I saw the oddest little locomotive come panting along with two cars, and she stopped right near where we were. She had "S. F. & A. R. R." on her tender and her name was "J. G. Kellogg." She was very sociable, and after asking me some questions, told me that Mr. Stevens had built her right there at Alameda Point, and that she was hauling local trains from the Point out to near Melrose, and made four trips a day. This was her last trip, and as it was getting dark, I asked her where the round house was located. The Kellogg just smiled and exclaimed, "Round House! What on earth are you talking about? What is a round house?" I explained what it was, and that engines went to bed there at night. "Why you silly goose," said the Kellogg, "we do not have any such thing down here. We sleep right out in the open, and even though the fog is cold and damp, we are used to it and don't mind at all." So I had to sleep out in the fog all night, and it was terribly foggy and cold, but the Kellogg said that was nothing, you ought to see a real fog some time.

We remained there in Alameda for several days, and then we took the Director's Car and went back a few miles, crossed over onto another track and right down to Oakland on a street called "7th" and when we came to a mud puddle, where there was a sign reading "Broadway" we ran onto a siding and stopped. Well, it may have been Broadway, for the street was wide enough, but there were no houses and nothing but mud, and I could hardly believe my eye when I saw a bobtailed horse car with two horses coming down that sea of mud. One would never have known that there were any tracks there. About this time, a small locomotive with the name "Liberty" on her cab, came along 7th street with two small cars, and some folks got off those cars, got in to the horse car and they all went away. This little locomotive was an odd looking thing. She had a tank pretty much like mine, had four drive wheels, and in front she had two small wheels. Said she belonged to the San Francisco and Oakland R. R. and was hauling the local up from San Antonio to 7th and Broadway. At San Antonio there was a wharf where a ferry boat came to about four times a day with folks for Oakland, and this ferry took some folks back to San Francisco.

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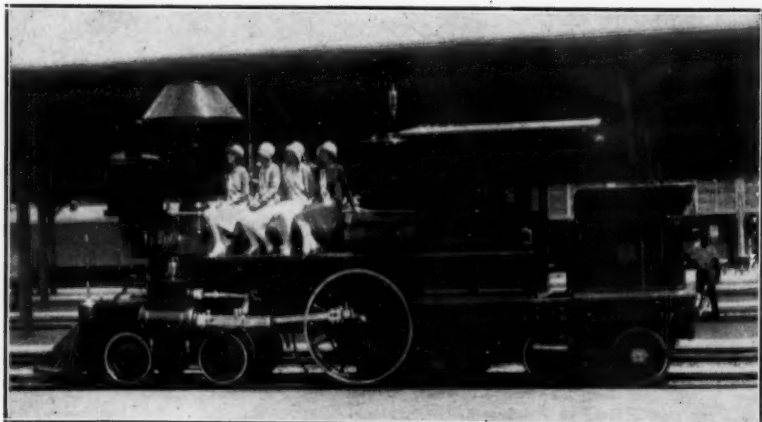
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—Joslyn Photo.

They carried me through the streets in Gov. Rolph's parade.



—Courtesy of Geo. Winalow.

Four fair young ladies took a fancy to me at the new Sacramento Station, 1925.

I learned from the Liberty that the Central Pacific R. R. was going to run trains right down that track to that wharf, and then the passengers would get off the train and go to San Francisco from Oakland instead of from Alameda. Sure enough, a few days later, the C. P. train came down that track and right out to the wharf, and when it had gone by, we followed it. The crowd began to come from all directions, on foot, in buggies, in hacks, and some on horse back. Down there somewhere a cannon was booming for all it was worth, and I thought maybe Capt. Siddons was there with his Union Boy, but I found out that it was someone else.

All the small buildings along 7th street were decorated, and we could see that the buildings up town were decorated also; and that cannon just kept booming away until one had a headache from the din. I'll bet that cannon was just as hot as the Union Boy was the day the last spike was driven. Pretty soon it got dark and we could not see very much as there were no gas lamps in Oakland in those days, and the little kerosene lamps on poles were pretty far apart. But all the bands got together and played at one time. The fire crackers were popping off, Roman candles and sky rockets were going up, and the crowd was cheering for all it was worth. There was a big stand along side of the track, and some men got up there and made some pretty speeches, and I'll bet you would have laughed had you seen the kind of lights that were on that platform. They were candles stuck in potatoes and they DID melt down fast in the wind. Mayor John B. Felton of Oakland made the best speech of all. He said, "Ladies and Gentlemen, this is the birthday of Oakland as a great commercial city, and it is due to the Central Pacific Railroad." My how the crowd did cheer then. But I will not try to tell you of all the speeches.

The very next day, November 8, 1869, the first overland train pulled out of the wharf at the Point, and came up 7th street. The locomotive Antelope came along with that train, and as she passed gave me a wink and was gone like the wind. The Oakland paper, which one of the men was reading had big headlines reading, "Today comes thundering into Oakland the great Iron Horse."

A little later we followed with the Director's car, and there were some other men got on it when we had backed down to the wharf. Mr. Stevens did not go back with us, but Mr. Crocker did, and there was a Mr. Fair and a Mr. Sharon got on the car. Some one said they were big mining men from a place called Virginia City, where ever that was. The Mayor of San Francisco and the Mayor of Oakland got on, and the car was pretty full.

We got back to Sacramento that afternoon, and the next day I had a new engineer by the name of Hopkins. Our work was to haul supplies out along the Western Pacific, where the men were putting in sidings.

After several years of hard work hauling supplies out along the line, doing a little switching around the yards, and all that sort of work, I began to get dirty. My nice red paint was not as shiny as it once was, and my wheels were so badly worn that I would go off the track and

then the men would swear dreadfully, and have a hard time to get me back on.

Then I was taken into the nice new machine shop, where the slough used to be, and my wheels were taken out, and I was just about taken all apart. Then everything was put back all repaired and like new. I was given a nice new coat of red paint, but instead of C. P. R. R. on my tank, the men put S. P. in a kind of scroll, or as they called it, a monogram. On my sand box they put the number "1" in place of the number 3, and thus I became number 1 of the S. P., and have had that number ever since; although in 1891 my number was supposed to have been changed to 1001, but that number was never put on me anywhere.

This was along in July, 1871, and I was sent down to San Jose where I used to pull a small train to a place called Tres Pinos, and when the road was completed to Hollister, I hauled the trains to that place. Sometimes I would take a train to San Francisco, and that was always an effort as there were some terrific hills to climb, and my engineer was not as nice and kind as Mr. Lonnergan had been. This engineer was named Kelly, and while he was a nice man, he could swear dreadfully, and did swear and fume and get mad because I could not always get up that hill, and we would have to go back and make a run for it.

Sometimes I would take the car "Stanford" out along the line, and then I had an easy time of it. Mr. Stanford was never in a hurry, and we would stop lots of times while he got out and looked around to see how the work was getting along. Mr. Stanford always wanted me to take his car whenever he came to San Francisco, and I was always glad to take his car out, as it was lots of fun and not hard work.

I must have been there in San Jose about 14 years, when the men said I would have to go back to Sacramento to have a new boiler. My boiler was old, and while the men had put in new flues, and fixed me a number of times, it was thought best that I go home to have a new boiler. For you must know that I always thought of Sacramento as home.

So, one bright day in 1888, I went out without any cars, and I was just as tickled as could be; for I was going home. There I would see the men that I knew when I was a young girl, and there I would see all my old friends that I had not seen for a long time. But what a disappointment for poor little me! Why, I hardly knew the place anymore. We came down R street on the old tracks of the Sacramento Valley Railroad, and there was no engines on that road that I knew at all.

Where the cut used to be at 21st and R street, the men had taken all that hill away, and a winery was on one side, and a brewery on the other. When we came to Front street, the old Sacramento Valley station was gone, as was also the Central Pacific Station, and the old California Pacific R. R. bridge. A new bridge had been built further up stream, about where the steel bridge is now. I looked and looked to see some engine that I knew, but there were none. I was a stranger in my own town. Those engines that I did see, looked at me as though I was a curiosity. We kept going along Front street and instead of going across the slough, we went right on; and then I noticed the trestle was

not there anymore, and a huge new station had been built where the Cal. P. used to have a little shed for a depot. I saw the Stanford up there by the new station, but she was too far away to speak to, besides, she had been rebuilt and did not look just the same anymore.

Then like a kitten that flattens itself as small as possible when it sees a dog, I tried to do the same thing, for here came a giant of a locomotive on the next track. My it was a monster! It had the name "El Gobernador" on the tank. It never even noticed me and I was glad that it didn't, for it surely scared the wits out of me. Then I leaped for joy, and my engineer said, "Steady, old girl." I guess he thought I was going to leap off the track. But I leaped for joy again, for here came the Atlantic, but she did not have any name on her cab, only a number. I did not get a chance to talk to her, although she said, "Hello little one, glad to see you," as she went by with a string of cars. My engineer ran me up along side of the old Chinese laundry that was still there, and on the other side of me was a pile of wood, but I noticed there was not as much wood as there used to be. A little way further over, I could see a huge pile of coal.

I can tell you, I was sick at heart. I just sat there and was as blue as could be. Then when I began to get over my heart ache, I noticed another engine sitting a little ways over by the wood pile, and Lo and Behold, it was my sister, the T. D. Judah. But she did not look quite the same, and she had a pair of wheels under her cab and a separate tender. She saw me at the same time, and if we didn't have a talk fest that night, then you miss your guess. My sister told me that some of the engines that we had known had been scrapped, some had been sold, and a whole lot of new engines had been built. There had been built a monster numbered 229, and another monster named El Gobernador and numbered 237, and other engines had been built besides. A whole lot of new engines had come from the east. Sister told me that most of the engines were burning coal now; although they still had diamond stacks. Said that she was burning coal and did not like it. She also told me she was going down to a place called Berkeley where she was going to pull some cars to that new town over a new railroad.

Just then a train came over the new bridge and it had an engine with a straight stack and looked so odd, I just couldn't get over it. Sister said that nearly all the new engines had that kind of a stack now, and that maybe we would get one like that. I hoped not. I did not like them at all. For the next few days I just sat there, but my sister went away soon, and I saw her as she went across the bridge towards San Francisco. Then Mr. Stoddard and Mr. Eichrodt came down there in the yard and measured me up for a new boiler; and soon I was in the machine shop and completely dismantled. My wheels got some new tires—a different kind than I had before. New shoes and wedges were fitted to my frame, some repairs were made to my tank, and then a new boiler was put in place. Then I got the surprise of my life. For when my side rods were put on, it was done by Mr. Wilder who was now working in the shop as a machinist. Golly, I was glad to see him.

When everything was already, I went out on a trial trip—out to the American River bridge where I had my picture taken when I was a young girl. But the old bridge was gone and a new one took its place. The levee was higher, and nothing reminded me of the other day I had had my picture taken. I remember when we got to Roseville—that used to be called Junction—I met a lad out there, and he rode back with us. He was so interested in engines, and my engineer let the lad run me back to town. His name was Walter Sheils, and he later got to be an engineer, and I learned that he was a good engineer, too. He was always so careful and never took a chance. In 1928 he was killed when a mule got on the track right in front of his engine. The mule was killed, and part of its leg got under the front truck of the engine and derailed it, and poor Mr. Shiels went over the bank with his engine and was scalded to death. That was very distressing news to me.

While I was in Sacramento, before going back down to San Jose, Mr. Stevens died. The whole shops shut down, and half the railroad quit running so that everyone could go to his funeral. But so many wanted to go, that they held a private funeral for him in a cemetery in Oakland. He was such a nice man. So kind, so gentle, and he always spoke to every man that spoke to him. He was never stuck up a bit, although he was a big man in the railroad.

I went on back to San Jose, very sad about the death of Mr. Stevens, and as I went out of the yards, I saw the Pioneer of the old Sacramento Valley Railroad, and several other engines sitting near the coal pile. They said goodbye, and that was the last I saw of them, for a new Supt. Motive Power, as the position was now called, came to Sacramento, and he cleaned up everything around the yard and scrapped all old engines that were not working.

After a couple of years hauling a train on a short branch line I was set aside as too small to be any good. But in a month or two, I was sent up to Oakland and helped my sister haul some small passenger trains out to a town called Berkeley, but the both of us were too small for that work, so we came back to Sacramento; and my sister was sold to some sugar factory in the Hawaiian Islands—only in those days they called them the Sandwich Islands. She went away and I never saw her again.

Then I was fired up one day and went out with a smelly old paint train, and hauled the train around the country while the men painted the bridges and stations. Not much work, but very degrading; and to make matters worse, I was painted a sombre black color, but the men did leave my nice monogram on my tank. But I got so dirty that you would never know what the monogram said.

While I was on that job, a Mr. Noyes and Mr. Stoddard came and got me one day and took my picture by myself, and with a big compound engine numbered 1787, or maybe it was 1791, I don't remember. Mr. Morrison was there also, and he took some pictures of me.

When the paint work was done, I was set down in the yard again with some of my old friends who had gotten too small to do any real

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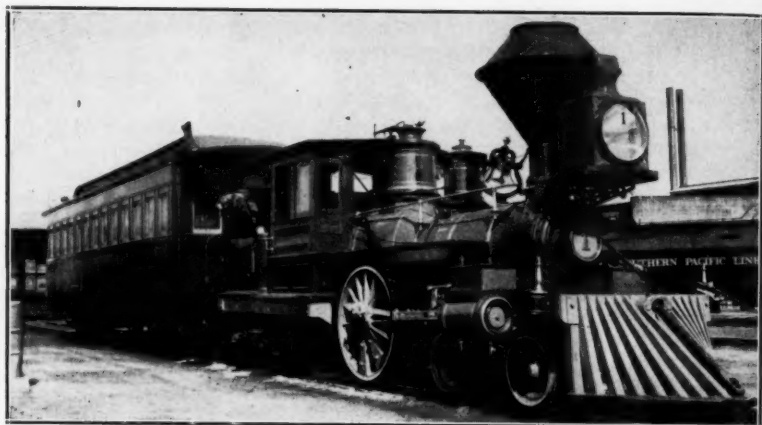
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"Jerry" Best took my picture at Los Angeles.



—Joslyn Photo.

At Ben Ali, January, 1939.

work. For they were getting some big engines by now. This was about 1897 that I was set aside. But soon Mr. Stoddard and Mr. Jesse Martin came along one day, and Mr. Martin said, "This little old girl will do!" I was sort of burned up at being called a little old girl, but then you know I was getting a little old as far as locomotives go, for a locomotive that is twenty years old is considered very old, although some do get much older; but you can bet that if they do get much older, they have to be rebuilt. Well, this man Mr. Martin was a tall handsome fellow, and a very smart man too. He was the first man to apply an oil burner to a locomotive and have it work. Also Mr. Martin worked out several kinds of bell ringers for locomotives, so that when the fireman was busy shoveling coal, and the engineer was busy, the bell would ring. Oh I tell you, Mr. Martin was a smart man all right enough, and I am glad that I knew him. He is dead now—seems like all my old friends are dead.

Well, I was taken up to the machine shop and a big oil tank was put up on the back of my tender, and a huge thing was put out in front where they took my pilot off, to put that heavy iron work on. When all this work was done, I was fired up and "Bill Kopka" engineer, and George Teiss fireman, took me out along the line where there were a lot of weeds. Mr. Stoddard and Mr. Martin, and several other men went along. They lit a fire in that huge iron work out on the front of me, and that fire burned from the oil in the tank on my back. My but it was hot. I nearly died from the heat. We went along slowly, and that fire just burned those weeds right down to the ties, but it also set the ties on fire, so we went back and got a wooden water car, and it was some drag on me to haul that and shove that big burner out in front. That burner was so heavy that sometimes it would raise my drivers right off the rails, and they would spin around, and we would not move. Then we would let the water car loose, and the men would get some big bars, and by working them under the wheels, would get me going again. But after a few weeks, I was taken back in the shop, the burner was taken off, and I was set aside as worthless.

I forgot to tell you, but in 1891, when all the engines got their numbers changed, mine was supposed to be changed to 1001, but the men never did paint that number on me, and I still am known as number 1 of the Southern Pacific. Well, it was in 1898 when I had that weed burner on me, and I never did any more work after that. Just sat there in the yard, and 1900, June 1st, I was ordered broken up. That sent a chill through my heart, and there rushed through my mind all the things I had done, and all the places that I had been. I could see all those events as plainly as if they had just happened. "Broken up June 1st, 1900," was officially written in the roster of locomotives, and I was dead. But for some reason, the men let me sit there in back of the old tender shop, and I WAS NOT broken up. But there was a big bumper at my back, and when more engines were shoved in on the "dead" track, they kept banging me back against that bumper until it made a big hole in the back of my tank. They never put my pilot back on after they took

the weed burner off, and my front bumper head got pretty badly smashed by those locomotives being pushed against me.

When they took my bell for some other locomotive, and my stack, which was rusty, fell off and down on the ground one day, I was surely a sorry looking sight, but I was supposed to be dead, scrapped, no longer on the roster, so what did it matter to the men.

About the middle of August, 1902, a skinny, shy, not too good looking boy came out there one noontime and walked all around me, and looked me over. He got up in my cab and tried my throttle, which still worked, and he opened and shut all the valves that were left on my back head. Well, next day, that skinny boy brought his lunch out there and got up in my cab and ate his lunch, and played that he was engineer. He would shove the reverse lever forward, open the throttle, pull the whistle cord which he tied to the lever, and just play that he was engineer. I got so I liked that boy, and we became fast friends. I remember how the other boys used to make fun of that friend of mine, and the men used to poke fun at him, but he did not seem to mind it, although I saw tears in his eyes sometimes, and his voice would get a little husky after the other boys would push him over and call him "sissy," and other names. But he would say, "No. 1 likes me, don't you, No. 1"? I remember how mad that boy got when some of the round house men came and took my headlight away to put on another engine. That boy was mad enough to fight, but the men just laughed at him and shoved him over into the dirt. I was mad enough to fight, myself. But what could we do? I was so helpless, and that boy was so skinny and small.

About 1906—I think that was the year, I cannot remember exactly—the old 1004 which was now Sacramento Shop's No. 1, came there and hauled me out of the dirt, and pushed me up to the brand new machine shop that was just finished. Mr. Wilder came and took off my rods and some other men came and patched me up here and there. An old German fellow, I cannot recall that man's name, came and took what was left of my smoke stack and made a new one, only he did not put the cone back inside the stack. I had a bell from another engine that was being broken up, and a pilot off an engine that was being made into a switcher. Spare parts were taken from here and there, and I was made fairly presentable again. Then a coat of black paint was put on all over me, and Mr. White painted the monogram back again; and also the numbers, but he didn't use gold leaf—only white paint. Then I was put up on a platform at the South end of the machine shop, where I could watch all the work that was being done on the huge new engines. A few of my old friends would come in once in a while for a little work, but they had been rebuilt, and were renumbered, and some had a loss of memory, and did not know me; so I felt all alone in the world—a strange world. The skinny little boy—he was bigger now—would come and look up at me sorrowfully like and walk away. He missed me, and I missed him.

Well, I remained up there until early in 1914, when they took me down and I was pushed down on the old laundry track where engines

were broken up, and some men came one morning with hammers and wrenches, and just about got ready to break me up for scrap, when the Supt. came running out waving a telegram from San Francisco and yelled, "Hold it, fellows!" A few hours later the "Big Hook" came, and I was lifted onto a little track out of the way. A house was built over me, and I was all out of sight. What saved my life, I did not know at that time, but I learned afterwards, that one of the men took the matter up with some one who was high in the S. P. and they ordered it saved.

Then in November, 1914, I was lifted back on the tracks, taken up to the machine shop, and Mr. Wilder took my rods off again. Mr. Peters took my valve covers off, and some other men took my cylinder heads off, my eccentrics were taken away, too. They just cleaned all old rust off of everything. The painters came and scraped the old black paint off and, Henry Hagstrom and Dave Joslyn came, and with Mr. George Herr, they fixed a nice patch on that old hole in my back, which had just been boarded over when I was put up on the pedestal in the machine shop.

Henry Shartzter and some of his men came and fixed my brake beams, and Mr. Jacka put a new running board on the right side of me, and fixed the other one up like new. The pilot men came and fixed my pilot like new, and I was just in a stew to know what it was all about. I knew that I was not going into service, because they did nothing to my boiler.

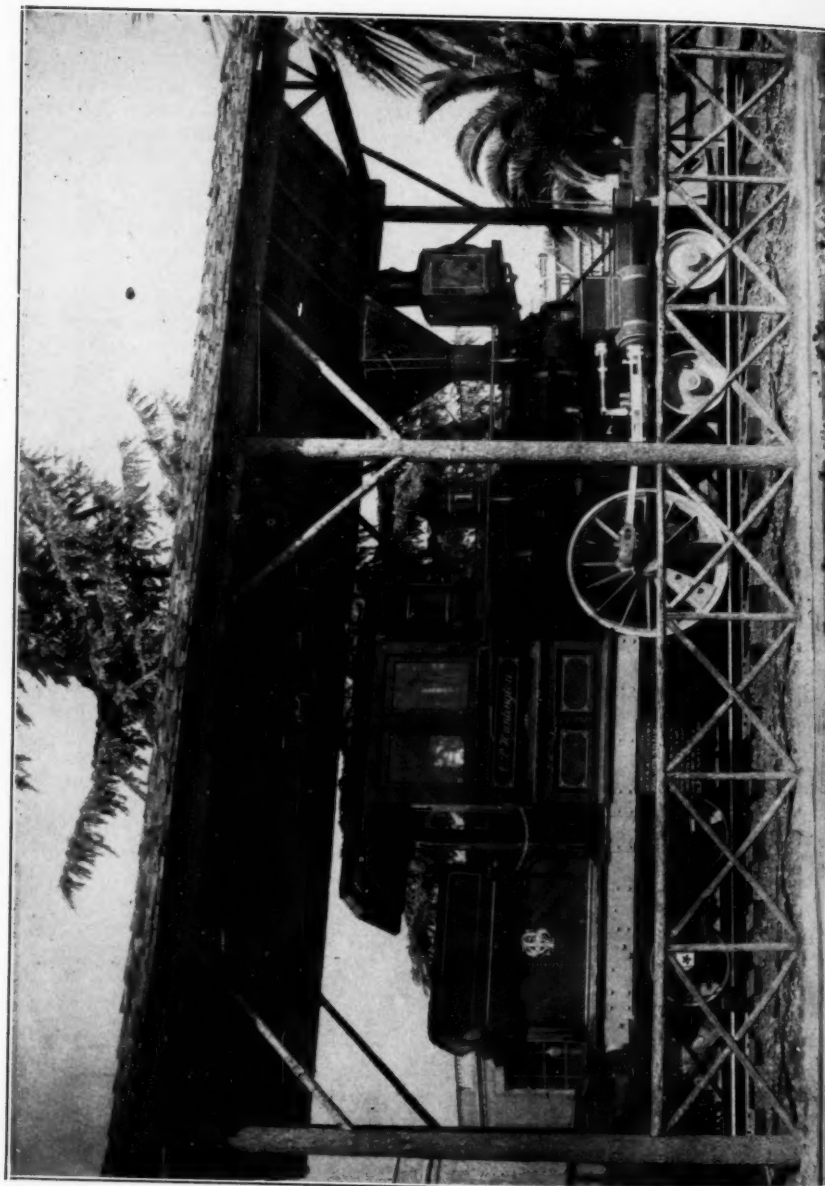
Then I was put in the paint shop, and the painters worked on me for days, putting back the nice shiny red paint, only a different shade than when I was new. They put gold letters and stripes on me, and my monogram was put back in gold leaf—real gold, too. I did not know myself. My hand rails were taken to the plating room and plated with nickel, and the same was done with my bell and whistle. Oh, I can tell you, they fixed me up just grand. Then I was loaded on a flat car and was taken to San Francisco, and was put on exhibition at the World's Fair. I had a stretch of track all to myself, with a fence to keep the folks from climbing all over me. I remember there was one of those big new mallets right along side of me on another track. Well, you should see all the folks that came and looked at me. One day that skinny kid came; only he was not so skinny now. He had a wife and two little boys; and that fellow told his wife and boys how he used to come and play engineer with me when I was sitting out on the "dead" track. After the fair was over, I came back to Sacramento and was put on a track outside the new machine shop, where I remained for a while, then they took me out to a knoll in the plaza by the old station. I sure did get dirty out there. But I liked it, as folks would come and look at me, and laugh about the little transcontinental engine of the old days. I remember a man by the name of Dick Jackson, and he was a nice fellow. I liked that man right away. He came and took some pictures of me, and he even took some stereoscopic pictures, just like Mr. Alfred Hart had taken back in the 60s and 70s.

About the middle of April, 1922, Mr. Watkins, the general foreman of the shops, and some city officials came out there and looked at me and talked about a "Days of '49" that they were going to have. Then a few days later, Mark Hook, the engineer on the yard engine 1156 came with the big hook, and Mr. Rankin, the foreman of the wrecking crew, and his men lifted me off the knoll on to the tracks, and I was taken up to the shops, where Herb Becker, the boiler inspector, gave me an inspection, and tested my boiler with water pressure, and golly how that boiler did leak. Well, they took my flues out, put in new ones, fixed the leaks in my boiler, cleaned and oiled me all up, and then fired me up, and I went up and down the tracks there in the yard with Mr. Van Dyne, the shop goat engineer running me. A few days later, I went over where Sutter Lake used to be, they had filled it all in with sand from the river and that was called China Slough by the men, but Lake Sutter was the proper name. I was coupled onto a flat car all fixed up with seats, and every hour during the day, I would haul that car out B street to the West levee, then over to a place near Perkins, and back into town on R street on what used to be the Sacramento Valley R. R., and then up Front street by the river, and back to the old 49er village that the men had built on that sand lot. It was lots of fun. Mr. Lonnergan, who used to be my engineer when I was new—he was along in years now, and was president of a big brass factory in the east and very rich—but when he came, he knew me, and I knew him, and he got up in my cab and asked to be allowed to run me, and he ran me around on one trip. And Mr. Pat Sheedy, who used to work on me years ago, he came there one day, and he was Supt. M. P. at the Los Angeles shops now, and Mr. J. Dyer who used to be a switchman, and he was general manager now, and Mr. Williams, the Supt. M. P. at Sacramento, and lots of other men all came and rode on that car, or in my cab. I was right in my glory, I can tell you! And all those men posed along side of me one day, and a photographer whom I did not know, took my picture with those men there. That was a wonderful week for me as so many of my old friends came to see me and rode on that car for 49 cents round trip.

After the 49er fair was over, I was put in the machine shop for a while, then went into the paint shop where a big canvas was put over me to keep the dust off. Then men began to think that after all the little C. P. Huntington was of some value. From then on, things worked fast. I was loaned to the moving picture folks who used me to film part of the story of the "Iron Horse." I was taken to Hollywood where I sat outside the Egyptian Theater for a long time, while the picture that I helped to make was being shown there. I was there during 1925, and while I was there the Shriners had a big time in Los Angeles, and lots of them came out to Hollywood, and when they had the big parade there in the evening, thousands of Shriners came out there. And then here came my friend, that skinny boy, who had now gotten quite—shall we say fat? He had his wife with him, and helped her to get up on my pilot beam so that she could see the parade, and you may be sure that

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The "Little Lady" in her home, June, 1942.

—Judy Photo

fellow had a Shriner's Fez on. I was proud of him, as he had now become one of the designers for the S. P., and did not have to work in that old boiler shop where it was so noisy and cold.

Mr. Hungerford borrowed me from the S. P., and I took part in the "Century of Progress" at the fair at Chicago, and Mr. Hungerford was proud of me in that pageant of his.

I was loaded on to a huge iron truck and a team of 20 oxen hauled me around town in the parade when "Sunny Jim" Rolph was inaugurated Governor of California. I took part in the opening of the new S. P. cut-off on the Cascade line in 1926, and in 1930 I took part in the opening of the big new bridge across the Carquinez Straits.

In 1936 I was sent on a flat car all the way down to New Orleans to help dedicate the Huey Long bridge across the Mississippi river, and I had a wonderful time down there watching all the folks that came to look at me.

And again in 1939, I was sent to Los Angeles and took part in the parade of old engines at the opening of the new station there. I met Jerry Best down there, and he made some pictures of me hauling an old Virginia and Truckee car.

Then when I came home again—Sacramento, you know, is my home—Big Mike, the Greek foreman of the Sacramento District of section hands, brought some of his men over and I was loaded onto a huge truck, an auto truck, and was taken out in front of the S. P. Station right across the street from the Judah Monument, and Big Mike and his men put me where I am now. The men built a rustic red wood shed over me and put a fence around me to keep the folks from climbing all over me. And that is where I am now. I have some nice redwood trees that give me shade, and I have a bed of flowers along side me. Sometimes there are pansies in that bed, sometimes other flowers. You should have seen the tulips that bloomed there one year.

I guess my travels are over. I am content to sit here and watch the folks come and go, and I like it now to have so many folks look at me and marvel how I ever pulled a train. But I did that very thing when trains were not as big as they are now. There is just one thing I don't like. I don't like the smell of gasoline, and those autos racing up and down "I" street all day and half the night, sort of get me worried at times. They go so fast, and come so near running into one another, and into people, that I just close my eye for hours at a time. Still, it is nice sitting here and dreaming of all the men that I have known in my time. Now if anyone asks you about some certain dates, just tell them the old "C. P. Huntington" told you all she could remember. Her mind is keen, you may say, but her memory fails her on some things.

I am glad to see so many men and women carrying on the great work that was started by my old friends, Mr. Huntington, Mr. Crocker, Mr. Hopkins, and Gov. Stanford, who are known as the "BIG FOUR." And I can recall many others who have passed away, but who were good friends of mine. Mr. Strobbridge, Mr. Wilder, Mr. Sam Gerrish, Mr. Benj. Welch, Mr. Ira Shaw, Mr. George Stoddard, Mr. Benj. Goodman,

Mr. Andrew Stevens, Mr. Pat Sheedy, Mr. Charles Shiels, Mr. Chas. Noyes, Mr. J. J. Luckett, Mr. Martin, and a whole host of others whose names I just cannot recall right now. They were all nice men, and they are all gone now.

But I have other friends in these later days, Mr. Williams, Mr. Venter, Mr. Taylor, Mr. Wilson, Mr. Hack, Mr. McCormick, and well, I just can't name them all, because there are so many of them. Just tell everyone that the old "C. P. Huntington" wants to be remembered to all of them."

And with that, the little old engine heaved a sigh and said no more.

The above story was told to D. L. Joslyn by the old Locomotive

Horatio Allen's Impressions of English Railways

The following three letters were found in the John B. Jervis Library, Rome, N. Y. and were copied and submitted by

WILLIAM CONRAD KESSLER

Liverpool, Feb. 24, 1828.

My Dear Jervis.

I am at length in the land of pine woods and in the atmosphere of coal smoke. I left N. Y. as you know on the 24 of Jan'y and on the 18th day out had soundings on the coast of Ireland. My passage was quite a pleasant one. Indeed after the first 5 days were past, (which were spent in no little misery from sea sickness) I enjoyed myself as much as I could on shore. The accomodations were ample and of the most superior character. On the 14. day of Feb'y we took a pilot on board and on the 15. at 10 in the morning I for the first time placed my foot on English Soil.

Since I have been here I have been introduced to Mr. Hartley the Engineer of the Liverpool Docks. He is considered one of the ablest men in the kingdom. I have found him a very pleasant, communicative man, perfectly willing to converse on whatever topic I wished to introduce. His business is the building of the Liverpool Docks. The Mersey upon which Liverpool stands has such high tides that, it would be very dangerous & inconvenient for the vessels to lay in the stream. Large basins are therefore constructed, which are connected with the river by locks of a size to admit the largest Ships. They have at present 45 Acres of Dock Space which is nearly all covered by vessels of every description. They are now about to build 5 new Docks or Basins, which contain an area of 40 Acres. It is in the management of the building that Mr. Hartley is employed. The masonry is of the most superior character. The stone principally made use of is a red sandstone similar to ours but not so good a stone. Not a stone goes into the wall that is not 6 or 7 feet by 3 or 4 by 2 to 3 feet. All the faces are dressed with the greatest care & the joints frequently less than the $\frac{1}{8}$ of an inch, and that too throughout the whole stone. 6 Steam Engines are employed in pumping, raising the stone, hauling up the wagons loaded with the excavated material. Every thing is done on a great scale and in the most perfect manner. The walls are in some places from 40 to 50 feet high.

I have also become acquainted with Mr. Stephenson the Engineer of the Liverpool and Manchester Rail Road. I have spent two days with him on the line of the Rail Road. He is the patenter of the Locomotive Steam Engine, a man of great experience in the structure of Rail Roads, and considered the first Engineer on that subject in the kingdom. In

two days as I before mentioned I accompanied him throughout the line. He employs 3 resident engineers who have their assistants. The Liverpool & Manchester road is nearly straight, being in length 31 miles, with two tracks, 5 feet from outside to outside. The carriages to be used on it are to weigh about 1 ton and carry from 2 to $2\frac{1}{2}$ tons each. Wheels with diameters of 3 feet and axles of 3 inches. The bearings about 8 inches long. The axles are revolving ones, that is the wheel is fastened to the axle and the axle turns in chairs. Stevenson (sic!) thinks from 10 to 12 lbs. will be sufficient to overcome the friction of one ton resting on the axles. The rails are malleable iron 15 feet long, supported every 3 feet by chairs. The rail weighs 35 lbs. per yard and each chair 12 lbs. The method of forming is ties, the ground is brought into the proper inclination and then covered by a coat of what is called "ballast" being broken stone, coarse gravel, and lastly sand, to the thickness of from 6 to 12 inches. The 1st layer is pounded down once and upon it the foundation stone is laid, which stone is about 2 feet square and 8 to 10 inches thick. The chair is fastened by iron pins driven into wooden pins which last had been driven into the stone. The ends of the rails are brought snug together without any allowance for the expansion or contraction of the metal. Mr. Stevenson (sic) thinks it unnecessary because the rails are laid on *stone* which will he thinks absorb the heat as fast as the rails receive it, and the contraction of course will not be allowed for. When the road passes over embankments, the chairs are placed on sleepers which are transversely to the road, in order that both rails may settle equally. When there are passing places the angle is 9 to 1 or thus. There are no double biseculas laid down on this road when I have seen some I will write you more particularly as to the method of turning out. The curvature that Mr. Stephenson speaks of as being the limit that will answer without very great inconvenience is 4 feet in a chain. The greatest curvature on his route is 9 inches in the chain or to a radius of 2904 feet. But the great velocity with which they intend to travel on this road is a very important consideration when determining the curvature to be allowed. It is intended to travel in 3 to 4 hours the whole line which will be 8 to 10 miles per hour. The power to be used is Steam, by means of locomotives and stationary engines. I have been through all the parts of the tunnel that are completed. The road as it approaches Liverpool gets into deep cutting and in to the red sand stone rock upon which Liverpool is built. The road is brought level to the mouth of the tunnel and then descends passing one mile and $\frac{1}{3}$ of a mile under the town in a perfect straight line. The descent is 1 in 50. The dimensions of the tunnel are a semicircular arch of 22 feet diameter and 5 feet perpendicular sides below the spread of the arch. That is 10 feet high, 22 wide on the bottom containing abundant room for two sets of tracks. The arch when ? is of brick in some places of two bricks and in some $2\frac{1}{2}$ bricks thick. The shafts through which the excavated material is raised and disposed of are from 400 to 500 yards apart and its situation determined by the compass. From each shaft they work each way, their direction being

preserved and regulated by the compass and level. They have thus far proven their work by the workers from the different shafts meeting each other almost exactly. When the tunnel is once completed the road is laid down the same as in any other place. It is more than $\frac{1}{2}$ done, and it is thought that it will be completed in June or July so that I may see it before I return to America. The termination of the Rail Road is near to the Docks and a set of tracks is contemplated along the whole line of Docks.

The road when completed and brought into full operation will give most trial of the relative advantages of Rail Road and Canal transportation. The canal route from here to Manchester is 50 miles. The rail route 31 miles. The present price of all charges on the canal is from 10/ to 15/-. The price intended to be charged on the Rail Road is 5/-. They go to great expence in the construction of the road, in excavating through ridges and embanking over low grounds in order to preserve their line as nearly level as possible. The road crossed a valley called Sankey Valley: in the valley is the oldest canal in the kingdom, upon which the canal boats have sail and masts; to enable the masts to pass along the canal the company are obliged to keep up the level of their road to an enormous height. The valley is passed by a "Viaduct" of 9 arches of 50 feet span and from where the Abutment terminates, embankments proceed both ways, where the embankment joins the Abutment it rising a/ 45 feet high. From the level of the rails on the top of the arch to the top water line of the Sankey Canal is 100 feet. The length of the heavy embankments, and viaduct together is about 1200 or 1300 yards or $\frac{2}{3}$ of a mile. Estimated to cost £60,000. It will be one of the greatest works of art when completed in the world. The tunnel is estimated to cost £60,000. The whole will be in complete operation in about 2 years.

I have had some conversation with Mr. Stephenson with respect to the fixed and revolving axles. He prefers the revolving axle most decidedly, unless the road be very curved. He uses the revolving axle altogether even in the small temporary rail ways laid down to facilitate the construction of the work, in which many of the turns are to a radius of 40 or 50 feet. He says that he is aware of the friction occasioned by the outside wheel having to go farther than the inside one. The experiment has been frequently tried according to his account, and has always terminated in the adoption of the revolving axles. He says that the wheels and axles get out of order, the wheels get a wobbling motion and tend to disturb the rail much more than when the wheel and axle turns together. Experience has shown according his account that the revolving axles take much less repairs, and that the waggons roll on with a more equable motion. Another advantage in his opinion is that the waggon is much less likely to leave the rail when meeting any obstacle. His reasoning is that when one wheel is suddenly stopped by an opposing obstacle the tendency of the waggon is to fly round the opposing point as a center and thus leave the rail, now if the other wheel be compelled to stop its rolling motion by means of its fastening to the axle, it can

only come round by *sliding* on the rail, whereas when the wheel is free to roll it will come round with much less friction, and of course be more likely to leave the rail. This reasoning applies with much more weight to a rapidly moving waggon than to one that is to travel 4 or 5 miles the hour. He recommends that when the wheels revolve on the axles that the bearings should be 12 in. each and perfectly cylindrical & that the flanges should be on the outside of the rail. His reasons are that when one wheel is suddenly stopped the flange on the outside of the other wheel acts with its friction with a great leverage to stop any motion round the opposing point as a centre and therefore opposes the tendency to leave the rail. I did not see any great force in his arguments; but as before observed they apply principally to great velocities. I have as yet seen no waggons in regular operation and am therefore only able to give you the opinions (and as far as I could get them) the grounds of the opinions of the men most highly thought of in this place.

I have been through the iron works of Messrs. Brown Logan and Co. They are principally employed in the manufacture of chains and anchors. I saw them try some bars of Welsh iron in their machinery for the proof of the chains. They have a different arrangement from the Sterling Works. The power is obtained by wheels & pinions, the strain is determined by a compound lever of which you have below a rough sketch:

It is a more satisfactory proof than the Hydraulic Engine—

I had a good deal of discussion with Mr. Stephenson with respect to friction. He is of opinion that when oil is used to relieve the friction of rubbing surfaces, the extension of surface is attended with a diminution. The commonly received theory, you know is that friction varies only with the pressure and is independent of velocity and surface. Stephenson thinks that this is not correct when oil is applied in which cases as I said before the extension of surface with the same pressure diminishes the friction. His arguments are that the effect of oil diminishing friction arises from the spherical form of the particles of oil, these act as so many friction rollers, if then the pressure on these rollers be so great that their true spherical form be destroyed they will not move among each other with the same friction, and of course not relieve the friction as much, but if we increase the surface, we distribute the pressure among a greater number of particles and of course the alteration of figure becomes less and the spherical form more perfect. There is some ingenuity and plausibility in the idea and I should like to see the question settled by experiment, which after all is the touch stone of truth.

I have sent to Mr. Bolton a plan and section of the Liverpool & Manchester rail. Bearing flatt surface is 1.1 inches. Width of tire independent of flange $3\frac{1}{2}$ inches. Wheel 3 feet diameter. Axle 3 inches. 12 spokes $\frac{1}{2}$ thick. Wheel cast solid except that the rim is divided into 3 pieces (as the plan will show) to allow for the unequal construction, the openings are after wards wedged up by malleable iron wedges and malleable iron hoops put INCOMPLETE

My Dear Friend

The enclosed letter was written rather as notes for a letter than for the purpose of being sent to you; but I have found myself so much pressed for time that I must either delay the letter untill the next packet, or send it in its present shape. As I thought you would be best pleased by getting it soon, I have determined on sending it, but have not been able to prepare the plans that I allude to. I have rough copies that I intended to copy and shall do so yet and send them by the next packet. I have written Mr. Bolton nearly a copy of my letter to you and sent him some plans which of course you will see. Some errors that I have made in a calculation in yours is (sic) corrected in his. I have not been able to get any one to assist me in drawing, and you know it takes some time.

I was much gratified by your favour of the 3 March. Its commissions shall be executed with great pleasure and all the care and judgment that I can exercise. Tredgold I think will be found a usefull work. I find that the makers of steam engines think well of it though they do not like the exposing the secrets of the trade. His locomotive is inferior to the lately constructed ones at Darlington. You will, I think, be much gratified at my account of the "*facts*" regarding the locomotive on the Stockton & Darlington road.

I can learn nothing of the wonderfull rope that you make mention of. No Engineer with whom I have conversed has ever heard of it. You will see by my letter to the President what Stephenson thinks of chains. On Steep planes he prefers them to ropes. I mentioned 1 in 12 particularly he said he would use chains most certainly. I can here (sic) of of no one using abtutition. Oil is almost invariably used. The ladies in this country are becoming rivals to Mr. Gerret in his balloon system, so *immense* do they make the sleeves and bottoms of their dresses.

I hope the Rail Road spirit (you see that I am following your letter through) may continue for many years. That there will be some exuberance there can be no doubt. I have received a letter from Mr. Bolton of April the 3d — am much gratified to learn that every thing is going on smoothly on the Delaware & Lackawaxen. I begin to think a view of their rocky shores would be no bad thing. As to the time of my returning I can not say as I do not myself know. My plans as far as I have any are to go to Glasgow, Newcastle, Edinborough xc and shall return from the north in about one month. After that I shall find my way through Oxford, Cambridge xc to London and how long I shall stay there I know not. From London to Paris and remain some time in France. On returning from the Continent I shall take a small peep into the Emerald Isle and then return to Liverpool and return to the land of freedom. It will probably be 3 or 4 months before I sail from this plan. Any thing I meet with that I think will be useful or interesting I will communicate.

Tell the Scotchman I am going into the land of lakes to spy out the nakedness of the land and that I promise myself the pleasure of writing him from Edinborough. You may tell Mr. Wurts that I am taking close

notice of John Bull and have opportunity of seeing him undisguised as I pass half the time for an Englishman. I frequently introduce the subject of America not apprising them that I am an American, and occasionally hear some bad opinions expressed.

When I reach London I shall (make) the proper inquiries as to the Society of Engineers. I do not despair of yet seeing the day when the United States will compare with any country on subjects connected with Engineering. I hope and believe that the evil you mention to be growing up on the Pennsylvania Canals will work its own cure.

The character of the profession has been much raised in this country during the last 10 or 12 years and it has been effected almost entirely by means of the exertions of the Engineers themselves.

With many wishes for your good health
and happiness, I remain
most sincerely your friend

H. ALLEN.

Please present my respects and affectionate remembrances to the Corps of Bachelor Engineers, not forgetting the Batcheldor par excellence, Mr. Wurts (or Watts?). I hope that he continues to enjoy good health. I shall be happy when I have the pleasure of taking a glass of Otane with him.

My health continues most excellent and hope will continue to.

Dear Jervis

Long ere this reaches you, you will have probably wondered "what can Allen have been about that he has not informed us as to the locomotives &c &c". I know that such have been yours and would in a similar situation have been my feelings, but circumstances have been such and the means of obtaining the requisite information so presented to me, that with all the diligence and attention that I have been able to put to it, it is only within these sheets that I can lay before you the result of my observations. A half formed opinion would be of no use to you nor satisfactory to me to give.

I have just returned to Liverpool having been at Newcastle, visited the Rail Roads in its vicinity and examined the operation of the Locomotives with the closest attention. I have been completely convinced of their ability and superiority to horse power. In your estimate of their power — in your report you have underrated their power and overrated their disadvantages. You will perceive by my account of the Stockton and Darlington Rail Road what they are actually doing every day. I have found that the Stockton & Darlington road was the best place for judging of their performance and have accordingly derived nearly all my information from that quarter. In order to enable you to make *your own* deductions of the capabilities and expense of Locomo-

tive Engines I give you an account of the inclinations &c of the road.—

The Stockton and Darlington Rail Way was undertaken with the view of opening the coal fields which lie in the south western part of county of Durham. It commences at the Wilton Park and Etherly Collieries and passing within one mile of Darlington, terminates at Stockton on the left bank of the River Tee which is there navigable for vessels of 150 Tons burden. The Rail Way is throughout a single line with from 3 to 4 passing places in every mile. The following table of sections will give the ascents and descents and enable you to judge of the performance. It commences at Stockton and proceeds westward. Immediately at the Shipping the road is level and section No. 1 commences a short distance from the Depot.

Sect.	Length	Inclination	Ascent	Descent
1	92.82 chns	1 in 104	59.98 feet	
2	64. chns	1 in 1584	2.66 feet	
3	4. chns	1 in 487	.50 feet	
4	64. chns	1 in 226	18.92 feet	
5	2. chns	level	level	
6	100. chns	1 in 253	26.10 feet	
7	167. chns	1 in 2112	5.25 feet	
8	18. chns	1 in 713	1.52 feet	
9	131. chns	1 in 204	42.30 feet	
10	129. chns	1 in 1408	6.04 feet	
11	140. chns	1 in 1584	5.84 feet	
12	16. chns	1 in 396	2.66 feet	
13	141. chns	1 in 135	69.03 feet	
14	81. chns	1 in 352	15.18 feet	
15	99. chns	1 in 135	48.47 feet	
16	180. chns	1 in 528	22.50 feet	
17	116. chns	1 in 121	65.25 feet	
18	73. chns	1 in 144	33.27 feet	
19	5. chns	1 in 325	1.00 feet	
20	37. chns	1 in 31	78.62 feet	
21	84.20 chns	1 in 33½		132.15
22	28.40 chns	1 in 576	3.25 feet	
23	61.20 chns	1 in 176	22.95 feet	
24	99.30 chns	1 in 31¼	206.40 feet	
25	50.40 chns	1 in 33		100.80
26	32.80 chns	1 in 495	4.33 feet	
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24.96 miles				

You will perceive from Stockton to the commencement of the incline plane section No. 20 the road rises with a varying and gradual ascent. To obtain the line some excavations and embankments have been necessary.

The rails are principally malleable iron rails of the form and kind patented by Mr. Birkinshaw. Originally cast iron rails of the patent of Lock and Stephenson were intended to be used, and some parts of the road have them yet. The first malleable iron rails used were 12 feet long and weighed 28 lbs. per yard. They are now using rails 15 feet long and weighing 32 lbs. to the yard. The rolling or upper surface 2 inches broad and in other respects similar to the rail used on the Liver-

pool and Manchester road excepting that the L & M rail weighs 3 lbs. more to the yard. They have heretofore been fastened by pins passing through the ends of the rails and chairs; but are now using the key as I have described in the Liverpool & Manchester road. The chairs are fastened to the foundation stone in the manner described in Wood, by means of a wooden pin in the stone and a spike through the chair into the wood. The foundation stones are evidently too small being only from 8 to 12 in. broad by 1 foot long x 8-10 inches deep. On embankments timber is used in place of the stones. They are laid transverse the road and are 5 or 6 in. x 4 or 5 in. x 6 to 8 feet. The chairs are fastened to each timber one at each end. The rails are placed 4 feet 8 inches apart from inside to inside. The turnouts are from 3 to 4 per mile according as the situation afforded facilities. The method of leaving the main road for the passing places is similar to that described by Wood and Strickland. All that is necessary to render their account intelligible is, to know that when a wheel passes through a double *branche* the *flange* supports the weight of the waggon & the rim is raised above the surface of the rail. The branches are however somewhat different from the ones first used. A different method is used to keep the wheel in the proper direction, as you will see by the plan and explanation accompanying this. The angle at which they turn is usually 1 in 7 to 1 in 8. That is, the length from which the rail will leave the main line to where it strikes the opposite side is from 30 to 40 feet. Some are even below 30 feet but they are found to rack the waggons very much. To cross in 45 feet or 3 lengths of 15 feet rails is recommended by those on the work. I could find none who could give me an account of the curvature of the road. I was therefore compelled to judge of it by the eye. The greatest curvature on the part worked by locomotives was from 10 to 12 inches in a chain or chord of 66 feet. The road curved considerably in various places. A very frequent was from 3 to 4 inches in a chain.

The arrangement of motive power is as follows. From the collieries at the head of section 24 the waggons are drawn by horses. Up the incline plane sec. 25 1 in 33. The waggons are drawn by means of a Steam Engine at the top of the plane; down the inclined plane sec. 24 1 in 31 $\frac{1}{4}$ they descend by their own gravity and their motion is regulated by a break (sic) on the same shaft with the Drum and also by the break on the waggon. From the foot of this plane the loaded waggons are conveyed to the foot of the inclined plane No. 21 up which they are drawn by means of an Engine at the top of the plane. Down plane No. 20 they descend by their own gravity and take the rope with them for the drawing up of the return train. From the foot of inclined plane sec. 20 to Stockton the waggons are conveyed by locomotives and horses. Principally by locomotives, horses only being used because they have not locomotives enough, the trade having increased more rapidly than had been expected. There are at present at work on these 19 sections (of which the total length is 21 miles) 5 Locomotives. 4 of them are on 4 wheels and the 5th is on 6 wheels. Those on 4 wheels are the first that

were used on this road and the 6 wheeled engine has been at work about 7 months. Each of the 4 wheeled convey to Stockton a train of 20 loaded waggons besides the Engine tender laden with coal & water. They perform the distance to Stockton & back to the foot of incline plane sec. 20 in about 10 hours the total distance passed over 42 miles. This time includes stoppages for water, coals meeting other wagons (sic!) etc. The six wheeled engine takes as a regular load 24 loaded waggons besides its tender and performs its trips in rather less time than the 4 wheels. The Engines, carriages and water weigh from $7\frac{3}{4}$ to $8\frac{1}{2}$ tons. Wheels are 4 feet in diameter. The quantity of coals to go to Stockton and back (dist. 42 miles) is from 35 to 40 cub. feet or about $\frac{3}{4}$ of a ton (which costs them delivered along side of the waggon \$1.00 per ton). Their water casks contain about a hogshead. The resevoirs of water are from 5 to 6 miles apart. They do not however fill at every resevoir but take a little at each. The Engine & train are managed by two persons. An engine man and a boy of about 18 to tend the fire. The load in each waggon is required by statute to be 53 cwt. but is more frequently 55 or 56. They may be taken at an average of 54 cwt. The Waggon, and wheels and axles weigh from 21 to 23 cwt. and some waggons more. An average would be 24 cwt. The engine tender may be taken at 2 tons weight. The above are the regular loads for the daily performance of the Engines. I went 3 times over the line riding on the locomotives and examining the motion etc. of the various parts of the Engines & waggons. The chain that formerly connected the two wheels has been done away and a connecting rod between each pair of wheels substituted. You will perceive that the 6 wheeled engine takes 20 per cent more load than the 4 wheels. This arises principally from its being the last Engine made and having its boiler and fire tube and cylinders differently arranged. They consider the 6 wheels *decidedly* superior to the 4 wheels and intend all their new engines to have 6 wheels. The waggons have wheels 2 feet 6 in. diameter and 3 inche axles. You will now have data enough to deduce the actual practical effect of the Locomotive Engines. The managing Engineer of this road is a man by the name of Timothy Hackworth, a man possessing strong natural abilities which being improved by habits of close observation, have given him great practical skill and experience. He belongs most decidedly to the class of "Practical Men" and I consider him one of the best of that school. He has had the management of this road from the commencement and it has been his daily occupation to attend to the management repairs etc. of the locomotives. He is a man therefore who has had the opportunity of forming a correct opinion of the merits of the locomotives, and whose opinion can be relied on with the greatest confidence. He mentioned to me two or three performances which exhibit the power of these iron horses to great advantage. It so happened once the 6 wheeled Eng. when returning from Stockton (found on Sec. 18 (inc. 1 in 144) 13 loaded waggons. The engine had its usual train of 24 unloaded waggons after it. The engine man rather than have the trouble of going back to a passing place for between a quarter and a half a mile pushed the 13

loaded waggons up the ascent of 1 in 144 and drew after it the 24 unloaded ones, all moving at about the rate of 3 to 4 miles per hour. Mr. Hackworth gave it as his decided conviction that he could take the 6 wheeled Eng. and convey 32 loaded waggons to Stockton and bring back the 32 unloaded ones perform the whole distance (about 42 miles) in from $3\frac{1}{2}$ to 4 hours!!!!

To obtain a comparative value of Locomotives & Horse Power, I applied to Mr. Hackworth for his opinion & he gave me the following account which he took from his books and are actual facts derived from the experience of one year.

I give you the comparison exactly as I copied it from his manuscript—

Account of the comparative expense of Horses and Locomotives by Timothy Hackworth on the Stockton and Darlington Rail Road from September 1 1826 to June 30th 1827:

	£	S	d
10 months Engine men at $\frac{1}{4}$ of a penny per ton per mile	969.	3.	8
10 months inte. on capital sunk at 10 per ct per annum on 5 locomotives at £540 each:	215.		
Say T Hackworths time divided into 4 parts at $\frac{1}{4}$ to fixed Engines, $\frac{1}{4}$ to locomotives, $\frac{1}{4}$ to distribution of waggons, $\frac{1}{4}$ to attending workmen at Shildon.	24.		
10 months repairs, grate bars, wheels etc. being the actual repairs.	186.	10.	8 $\frac{2}{3}$
	1395.	1.	0 $\frac{3}{6}$
From July 1st to Aug. 31st			
2 months as per Cos Books Loc Engine men $\frac{1}{4}$ pf a penny per mile	231.	16.	2
2 months interest on Capital at 10 per ct. 5 Engines at £500	50.		
T. Hackworth time	6.	5.	
2 months repairs grate bars deducted	19.		
	£289.	0.	.2
222536 Tons run over one mile cost $\frac{1}{4}$ d. per mile.			
£289. 0. 2. total expense on the above quantity			
Same work by Horse Power			
930416 Tons led by Horses at $\frac{5}{8}$ of a penny per ton per mile:	£2060.	10.	3 $\frac{1}{2}$
Allow $\frac{1}{8}$ of a farthing per ton pr mile upon the above quantity for keeping the Horse path in repair	121.	2.	11 $\frac{1}{2}$
	£2181.	13.	3

Horses will be then	£2181. 13. 3
Locomotives	1395. 1. 0¾
In favour of Engines	796. 12. 2¼
Engines did travel last winter when the horses could not. For the last two months we have for the comparison—	
Expense of Horse Power :	
222536 Tons led by Horses at ⅝ of a penny pr ton per mile :	£ 492. 11. 10¼
Allow ⅓ of a farthing upon the above quantity for keeping the road in repair for horses :	28. 10. 6½
	521. 11. 4½

The above statement is word for word as Mr. Hackworth had it written down, but he evidently wishes to err rather against than for the Locomotives; and it does not exhibit a correct comparison of the expenses of the two motive powers, in their present state of improvement. For in the first place the locomotives employed were the 4 wheeled ones whose load was only 20 waggons, whereas the 6 wheeled will take 24 waggons with the same quantity of coal, water and attendance.

2nd: The Locomotive Engines should have performed two trips per day instead of one.

3rd: He has allowed 10 per cent on the capital sunk and also all repairs are brought in. With proper repairs a locomotive Engine will according to the best information last at least 20 years. Taking the prime cost at £500 would give an expenditure of £25 per year in capital sunk.

4th: The item of his own services should not come into the estimate for locomotives without also entering into the calculation for the horse power.

5th: The grate bars which are now furnished by the Engine men and included in the ¼d. is enumerated among the repairs for the 10 months and must be an important item in the sum £186. 10. 8¾.

6th: The interest on capital as taken in the 10 months on the eng. as £540 each and in the 2 months on Eng. costing £500. and as the last two months were subsequent it is a fair inference that the price now is £500.

7th: The Engines performed part of the work in the winter when the horses could not.

8th: The price of horsepower is said to be at the lowest point and requires every thing to be in the most favourable condition to pay at all.

9th: There is a numerical error in the calculation for the last two months work of horses for 222536 tons at ¼ d. per ton per mile gives 231. 16. 2. and the same number of tons at ⅝ d. give 579. 10. 5 instead of 492. 11.

$10\frac{3}{4}$ and 222536 at $\frac{1}{8}$ of a farthing 28./608. 10. $6\frac{1}{4}$ instead of 28. 10. $6\frac{1}{4}$. His statement will enable us however to obtain a correct comparison.

I should have previously mentioned that the company contract with individuals for the conveyance of the trains to & from Stockton. The terms of the contract are that the company furnish Engine and keep it in repair excepting the grate bars for the fire, and also find the waggons and repairs. The engine men on their part find coals, attendance, oil, packing, grate bars and are paid at the rate of $\frac{1}{4}$ of a penny per ton per mile. This has been the contract heretofore, with the 4 wheeled Engines, when the train consists of 20 loaded waggons. But in the case of the 6 wheels it is considered too high and a reduction is contemplated.

When horse power has been used the usual price is from $\frac{1}{2}$ d. to $\frac{5}{8}$ d. per ton per mile to the person who furnishes horses, harness, attendance &c. This price is considered low, and all the workmen and persons on the road with whom I conversed agreed in saying that taken the year round it was very doubtful whether a person would not save money by such a contract and also mentioned several persons who had failed in their contracts & lost much money in attempting to execute them. I think the following comparison borne out by facts:

To make the comparison with the preceding connections, we have for the price which should be paid to the Engine men 24:20:11 farthing: $5\frac{1}{6}$ of a farthing. Horsepower I will take at $\frac{5}{8}$ d though I think it is low. Thus we have for the first 10 months.

930416 Tons to pay Engine men at $5\frac{1}{6}$ of a farthing—	£	S
	807.	13. 0
Ten months capital sunk supposing the above sunk in 15 years, 5 Eng. each £500-2500	133.	6. 8
Ten months repairs as by his account	186.	10. 8
Deduct for grate bars	6.	10. 8
Leaving out his superintendence	£1120.	19. 8
For the next two months.		
222536 tons Engine men at $5\frac{1}{6}$ of a farthing	£ 193.	3. $5\frac{1}{2}$
Two months repairs, grate bars deducted		19
Interest on capital		27. 15
Total Expense for—222536	£ 221.	17. $5\frac{1}{2}$
Then 222536 : 930416 :: 221-17- $5\frac{1}{2}$: 927.35.		
1860832 tons conveyed by locomotives=1120+927-6=2048-6-		
1860832 tons by horses at $\frac{5}{8}$ =4845-19-2		
1860832 tons at $\frac{1}{8}$ of a farthing 242-5-10		
	} =50985.	

That is 5098 : 2048 :: 2.48 : 1.- Taking the 10 months by themselves we have Locomotives to horse at 1:2 and probably the combining the 10 months and 2 months is not altogether as accurate as taking them separately. The comparison for two months gives us 608:221 or not quite 3:1.

There are still several items left out of this calculation which should come in. As the amount of stock of waggons. As the Engines move faster a less number of waggons will be required and allowing the durability to be as the distance we still save the interest on the excess.

I think therefore that you will come to the same conclusion with me as to the superior utility & greater economy of the Locomotives. I am fully of opinion too that the present Locomotive Engine is an imperfect machine compared with what it will be 10 or 12 years hence. The tractability of these iron horses is really surprising. The engine men will back them advance them stop them &c with as much as ease as a horse could be managed. The top of the chimnies are about 16 feet above the level of the rails. The dimensions of cylinder &c is not worthwhile to give as the new engines now constructing are upon a different arrangement and are expected to be superior. Mr. Robert Stephenson—son of George Stephenson the Engineer of the Liverpool & Manchester Road, is making one which is to be at work at the factory in a couple of weeks and to be put upon the Bolton road on the 9th of June.

The waggons employed on this road are generally with wooden boxes wrought iron axles and cast iron wheels with case hardened rims, breadth of rim independant of the flange from 3 to $3\frac{1}{2}$ inches. The rim bevels from $\frac{2}{8}$ to $\frac{3}{8}$ of an inche in the $3\frac{1}{2}$ inches. The wheels are all fast to the axles of a variety of plans as to spokes but the newest and most approved are similar to the Liverpool & Manchester wheels. They are generally connected by the centre. There are two ways of connecting them, one by means of a rigid iron bar and bolts passing through and the other by means of chains. The chains are preferred by Mr. Hackworth.

Plan No. 1 is a view of the underside of the waggons employed on this road, showing the mode of fastening the bottom and connecting the waggons together. The dimensions are all marked and the plans will explain themselves.

Plan No. 2 shows the manner of fastening chains to the ends of the side timbers. These chains are called "prevention chains" from the circumstances of their not being used except on the inclined planes where they are put on merely guarding against accidents in case the main chain should break. The plan gives dimensions.

Plan No. 3 shows the manner of supporting the break. The plan gives dimensions &c.

Plan No. 4 shows the manner of securing the bearing chair to the timber of the waggon.

On the incline plane No. 20 inc. $1\frac{1}{31}$ 37 chns. the loaded waggons are let down trains of 8 together. The Engine at the summit of the two planes 20 & 21 works both planes with the same rope. The engine draws 8 loaded waggons up No. 21 and the train then descends No. 20 by its own gravity. An empty train is then attached and wind to the top and let down No. 21 by its own gravity. The engine is a low pressure Bolton and Watt with two cylinders each 30 inches diameter, makes 21 to 22 strokes per minute each 5 feet 10 inches long. That is the piston rod

ascends 5 feet 10 then descends 5 feet 10. The Steam in the boiler $3\frac{1}{2}$ to $4\frac{1}{2}$ above the pressure of the atmosphere. A boiler to each cylinder 15 feet long and 8 feet diameter. The Engine is considered more than adequate to the work. The Friction rollers are placed about 28 feet apart some are 30 and some less. When the waggons were ascending or descending the rope did not sag in any perceptible degree. The rope is $5\frac{1}{2}$ inches in circumference. When the empty train of waggons reach the bottom of plane No. 21 they are turned into a side branche to make room for the loaded ones to ascend by means of the rope which the empty train brought down. The tongue or switch that is and to give the oblique direction is about 6 feet long by 6 in high with sides protected with iron. Plan No. 5 will give the dimensions of this mode of turning out. The signal for the starting the engine (the waggons being ready) is by means of a target about 3 feet in diameter painted white with a circular centre 18 inches diameter painted black. It stands edge-wise to the Engine and when the signal is given it is turned broad side to the Engine. The number of men to manage these two planes is 3. An Engine man who watches the target and puts in motion and regulates the motion of the engine, a fireman to attend to the boiler and a man who accompanies the ascending and descending trains and fastens and disengages the ropes. Plan No. 6 shows the contrivance for connecting and letting loose the rope. The usual load for a horse from m. 19 to Stockton is from 3 to 4 loaded waggons. 3 waggons is considered too few and 4 are considered too much for one horse. The wheels are oiled by the Assistant to the Engine man. Common oil is used. None of the waggons on this road have any arrangement for oiling by holes leading to the top of the bearings or chains. The axle is oiled from the underside. It is performed with a good deal of facility. The assistant is provided with a stick about 2 feet long with a "swab" at the end; he places it into the oil and applies it to the axle. The waggons are oiled before they set out, once on the way and again at Stockton and a fourth time on their way back. The assistant generally takes advantage of the times when the train is stopped to procure water to oil his wheels. I cannot learn that any composition has ever been tried on this road. Oil appears to be considered the best application that can be made.

Wheels and Axles.

On this subject I have taken advantage of every avenue to information that has come within my power and believe that I have collected all that can be obtained from the rail roads of this country. I have examined the wheels axles on the roads and at the collieries which are considered the best and have had much discussion on the subject with practical Engineers of the first standing in the country.

I find that on the most important roads that fixed wheels and loose axles have been and are invariably used. On the Hetton, on the Killingworth, on the Stockton and Darlington, on Mr. Thompsons, on the intended Liverpool and Manchester, the fixed wheels and revolving axles

are used entirely. I learn that from time to time many persons have attempted to introduce loose wheels. The additional friction arising from fast wheels was too evident to be overlooked and many contrivances have been adopted and laid aside. Formerly the attention of persons managing rail roads was much more strongly directed to this subject than at present, because the operation of case hardening the rims of the wheels was but imperfectly done, and the dragging of one wheel round made itself very evident by grinding into the rim of the wheel and an abrasion of the surface once commenced, it works rapidly into the wheel. At present the case hardening is done so perfectly that the surface is proof almost to the file, and though the friction is still there, it is unattended by the destruction of the wheels. In all the attempts that have previously made to introduce loose wheels the axle has been fast to the waggon and the wheel revolved on the axle, so that all the wear was in the nave of the wheel, this was found to be very considerable, the under side of the axle wore into a plate segment of circle and its edges soon ground away the nave, the wheel became loose on the axle and a wabbling motion was the result. The complaint too from the workmen was "they will not keep the road". In consequence of the wearing away of the nave of the wheel and the ease with which the waggon left the road the loose wheels have never been successfully introduced upon any extensive road. The remedy has been by making the roads as near straight as possible. Nearly every one who speaks of loose wheels, tells me they will not keep the road, but no one has pointed out a reason why a wheel's being loose should have any more tendency to leave the road than when fast to the axle. I am inclined to think the reason to be this: the flange of the wheel you will perceive is one inch high, and its surface inclines from the side of the rail, so that there is in the shape of the flange itself, some small hold for the wheel to "climb up" on the rim, and this will be particularly the case on curves as is shown by the grinding away of the inside of the outside rail; when the loose wheel has become worn away at the nave, the wheel itself may become inclined to the line of the axle as is shown in plan no. — and the wheel getting into the position represented on the plan, the flange very evidently does not present any thing like the resistance that it does when the wheel is compelled to keep at right angles to the axle, and on a curve with a pretty rapid motion it most certainly would leave the rail with much more facility than with a fixed wheel.

There is another circumstance which though not intended, and which no one of those with whom I have conversed has taken into account has undoubtedly tended very much to diminish the friction arising from fixed wheels in curves. Originally the rims of the wheels were at right angles to the plane of the wheel or parallel to the surface of the rail. When however they began to case harden the rim it was found necessary in order to draw the wheel from the iron mould in which it was cast to bevel the rim. When such wheels were used considerably, there appeared to be an advantage arising from the bevel wheels and they were made still more bevelling. So that now they make them bevel

$\frac{3}{8}$ of an in. in 3 inches. This circumstance of the wheels bevelling assists the going around a curve very much. There is usually allowed one inch play for the wheels, that is the distance between the insides of the flanges is 1 inch less than the distance between the rails. As the centrifugal tendency of the waggon crowds the wheel close to the outside rail, and brings the flange against it, the outside wheel will therefore revolve on a diameter $\frac{2}{8}$ of an inch greater the diameter that the inside wheel revolves on. Suppose the wheel to be (as nearly all the wheels in this country are) 30 inches in diameter; then the outside wheel will be $30 + \frac{2}{8}$ in diameter and inside $30 - \frac{2}{8}$ in diameter, when the wagon is turning a curve, then to find the curve in which two wheels one $\frac{242}{8}$ and other $\frac{232}{8}$ would naturally move is when the distance between the wheels is 56 inches we have the proportion to get the radius as $\frac{1}{4} : 56 :: \frac{242}{16} : 282.33$ radius. This you will perceive is a pretty rapid curve and is by calculation equal to a ? sine of 1 foot in 47 feet chord. This is a degree of curvature which is never met with at least I have never met with any equal to it. This brings us to a singular result inasmuch as it shows that when the curvature is less than the above, the same number of revolutions of the axle will carry the inside wheel farther than outside and the friction arising from their being fastened to the same axis and compelled to move together is operating in an opposite manner from what is usually thought; the wheel that is usually thought to move the fastest is actually moving the slowest and vice versa. I do not know that I have made myself clear on this point; what I mean to show is that by bevelling the wheels, the outside wheel although it has a greater distance to go *has also* a greater diameter to do it with and if the curvature be under the above, the wheel *gains more* by the increase of diameter than is lost by the greater distance to be gone over. This consideration may be of some value in cases where fixed axles are used in determining the degree of curvature for the road. When the curvature is that above determined, it does not however do away entirely with the friction arising from fixed wheels in consequence of the axles retaining their parallelism, were the axles moveable each round its centre then it would do away entirely the friction but inasmuch as the axles are compelled to move parallel to each other there will still be some friction left. These are considerations which when taken in connection with the small degree of curvature of the English rail road, show that the disadvantages on *their* roads arising from fixed wheels and revolving axles are less than one would at first suppose.

At the same time I am convinced that the wheels and axles may be so connected that the advantages of each mode may be secured and their disadvantages avoided, and that even on their roads would be superior to the fixed wheels. The plan that I allude to is to have the axles loose and the wheels loose. To have the axles fitted up with chairs in which the axles revolve exactly as when the axles alone are loose, and to have one loose wheel and one fast one. I have seen some wheels and axles upon this principle and the operation is this. When the road is straight the

wheels and axles all *revolve together* exactly as if the wheels had been fastened to the axle, but when a curve is entered and one wheel has a tendency to move faster than the other then the wheels yield to each other in the required degree and no more, and when the wagon gets into the straight part of the road wheels and axles again move on together as if they were one body. The fact (which has been established by considerable experience) of the wheels and axles turning in the bearing in preference to the wheel revolving round the bearing shows that there is less friction at the bearing than in the nave. This plan therefore appears to unite the important points of each species of wheels. First it brings nearly all the friction on the axles in the bearing as in the fixed wheels, and therefore as the axle wears away it continues truly circular. Second it yields sufficient on curves to prevent any dragging of one wheel to accomodate itself to the motion of the other and move over whatever wear is on the axle in the nave or in the nave itself is a circular wear.

I have not been able to learn that this arrangement has ever been tried on any of the principal roads to whose experience we should naturally look for the best arrangement. And when we find the principal roads still using $2\frac{1}{2}$ feet wheels, we may, I think, be allowed to exercise our own minds on the subject. They seem to have thought we must either have fixed wheels or loose wheels and never to have considered and put to the test of experiment the medium plan of having both loose wheels and loose axles; their not having them in use is therefore not to be considered as a decision of experience against them. The person whom I have met with who has had the most experience on this subject is Mr. Sparrow of Wolverhampton. He has several miles of private rail road for the accomodation of his collieries and iron works, and he has taken considerable pains to get everything on the best plan. Some years since the rail roads as well as waggons & wheels about the collieries were of the most imperfect description; Mr. Sparrow undertook to alter the system in this works and has done no little on it. The wheels many years since were low wheels with fixed axles. When Mr. S. commenced his improvements, he followed the plan of the principal Rail Roads and introduced loose axles and fixed wheels; but his road being amid his coal pits and furnaces was compelled to make an infinite number of short turns, and he consequently found that his horses could but with great difficulty get round his turns. The remedy was to fasten his axles and make his wheels loose. This overcame the difficulty he had in view of removing; but then he soon found that the wear in the nave of the wheel was very great and that his wagons were constantly getting out of order. His next plan was to have the axle loose again and have one loose wheel and one fixed one as I have been describing before. This arrangement overcame all his difficulties, for in the straight part of the road wheels and axles turned together in the bearings and in turning a curve the requisite yielding took place. These wheels he has had in constant use upon a *very* crooked road and from the examination of several I could scarcely perceive any wear to the axle on the nave of the

wheel. About 6 months since he adopted a new plan and rather prefers it to the last mentioned one. Plan No. gives you a view of his axle and wheels. The wheels are fastened to each axle, but the axle is cut in two at C. AB is a cast iron pipe which is ground out to receive the ends of the axles HC and HE which are turned to fit it snugly DE and DE are the bearings fitted up precisely in the usual way. To prevent the axles drawing out of the pipe AB a groove G is turned out of the axle, and a screw F with a steel end fits it snugly by screwing it into the pipe. A small hole is made immediately opposite the meeting of the ends to admit of oil being poured in and a thumb screw fits the hole when not in use. The operation is too plain to need any explanation. I examined some wagons very closely that had been in use about 6 months and they certainly worked extremely well. When on a straight piece of road they moved together as if fast to the axle and when they came to a curve it was really beautiful to see one wheel give just enough to accommodate its motion to the other. I had several of them turned up and the wheels taken off and pipe removed to see what had been the effect of the wear in the pipe and it was not perceptible. Upon enquiry among his men I found them all of one opinion as to the superiority of the pipebox axle. From all the information that I have been able to collect from the experience of observations of practical men here and my own reflections, I am clearly of opinion that the plan of having the axles turn in bearings and also the wheels capable of moving independent each other is the best arrangement for your road, but whether it will be best effected by means of loose axles and one fixed wheel and one loose wheel, or by means of loose axles, fixed wheels, but the axles divided in the middle and connected by a pipe in which the axle is free to move I am yet undecided; I am however rather inclined to give the preference to the latter.

First because the two wheels may then be precisely alike and the hubs of the wheels will be only $6\frac{1}{2}$ inches each in length whereas if they were on the first mentioned plan, the loose wheel should be 9 inches in the nave and the fast one need only be $6\frac{1}{2}$.

Second the wearing out of a fixed wheel with case hardened rim is almost impossible but with a loose wheel if there be any wear at all in the nave it must eventually injure the structure. But if a pipe is used should then be equal wear to ? of the loose wheel, the pipe can be replaced for a tenth part of the sum that the loose wheel can be. The prime cost too of the pipe box axle would be less too.

The difference however of the two plans is not very important but one of the two I think is the best calculated for your road of anything I have met with, and which ever plan I did select I would also have some of the other kind made in order to compare the merits of the two. Should the loose wheels be preferred I send you 3 plans of fastening them on.

No. 1 Plan No. is the plan adopted and recommended by Mr. Rastrick of Stourbridge. The plan will explain itself and give dimensions.

No. 2 is that recommended by Mr. R. Stephenson and is the one employed in the pair of wheels sent out to the company.

No. 3 is the plan used by Mr. Hartley at Liverpool Docks and Mr. Sparrow at Wolverhampton.

The last is the simplest and I am inclined to think equally good as either of the other two. It would be the one that I should recommend.

I explained the pipe box plan to Mr. Hackworth on the Stockton & Darlington road. He appeared very much pleased with it, and seemed to consider it as the best plan he had yet met with. You will perceive by the wheels and axle that I have sent out to the company that it is intended to supply the axle in the bearing with oil by means of a hole which passes through the bearing. I have seen several bearings and axles fitted up in this way, but have never seen any that the hole of which was not stopped up, and when the axle was oiled it was by means of a swab on the end of a stick. I cannot learn that any other plan has been adopted that answered the purpose. The nave of the wheels for fixed wheels are generally 6 to $6\frac{1}{2}$ in long and bored out cylindrically and the axle is turned to fit it. Great care is taken to make all axles and all the wheels precisely the same rise so that any wheel will fit any axle.

The most approved plan of fastening the wheel to the axle is by means of a round bolt of iron about $\frac{5}{8}$ in diameter driven in to a hole bored out for the purpose half in the axle and half in the hub of the wheel. When the wheel is loose the nave should be 9 inches long and perfectly cylindrical. The mode of fastening as above.

As to the rise of the wheels you will be as much surprised as I was when I first learned it, to hear that on the Liverpool and Manchester Road the latest construction of the day and intended to be a model to the world, it is intended to use 2 foot 6 inch wheels. Such however is the fact. On the Stockton & Darlington the wheels are principally $2\frac{1}{2}$ feet in diameter. At Killingworth from $2\frac{1}{2}$ to 34 inches. Mr. Rastrick who is making a rail about $5\frac{1}{2}$ miles long intends using three feet wheels, and he is the only one. I have endeavored in conversation to get some reason for keeping the wheels so small but have entirely failed. I have not heard one good reason either from theory or from practice assigned for the practice. From all that I can learn for the last 15 years the rise of wheels have been gradually increasing from 1 foot to 3 feet which latter rise is not quite yet fully introduced. I questioned Mr. Hackworth on this subject and found him decidedly in favour of using 3 feet instead of 2 feet 6. The reason of the slowness of this change I attribute to the extreme caution with practical men leave the beaten track. I have been able to discover no reason why I should advise your not adopting $3\frac{1}{2}$ feet wheels as mentioned in your report; on the contrary I am much inclined to think that we shall yet see them much larger.

The plan of applying the brake to fixed wheels you will perceive by the plans. The only alteration for loose wheels if it should be deemed necessary to apply the brake to all 4 wheels will be by having a iron bar

connecting the two brakes as I described to you formerly. It is the plan Mr. Rastrick is going to adopt. In the rise of axles they vary from $2\frac{1}{2}$ to 3 inches. On the Killingworth Road principally $2\frac{3}{4}$, on the Stockton & Darlington road 3 in., on the Liverpool & Manchester 3 inches (the waggons only to carry 2 to $2\frac{1}{2}$ tons), on Mr. Rastrick's intended road the axles are to be 3 inches. Waggons, wheels & axles to weigh one ton and load 3 tons. Mr. Sparrow in collieries uses $2\frac{3}{4}$ inch axles, the distance however between the rails is only 28 inches. His loads vary from 3 to 5 tons. His waggons are exceedingly roughly used and his axles are put to their strength occasionally by the usage of the workman. I have seen a waggon turned up for repairs and thrown back and the whole force of the empty waggon (not quite 1 ton) came down upon the axle. I am inclined to think that $2\frac{3}{4}$ axles are the most advisable for your road; though there is much reason to believe $2\frac{1}{2}$ strong enough. $2\frac{1}{2}$ inches however is below the practice of the principal roads in this country. The pair of wheels that I sent out and the plans will give you the other particulars of wheels.

I think the company will find it their best economy to get their wheels and axles in America if they can get them well done for the prices quoted by Mr. Bolton. I see no difficulty in their being made in America. The difficulties of case hardening the rims when the rim, spokes and hub were all cast at once, have been almost entirely been removed by splitting the hub of the wheel into 3 or 4 parts. The wheels are cast in an iron mould, that is the outside is iron against which the metal runs and being suddenly cooled occasions the extreme hardness of the rim. It is important that the melted iron should be put in quite hot to ensure a good chill or case hardening.

One of our members is working on the history of the Southern Ry. He would like the loan of the I. C. C. Valuation Report on this road. If any of our members are willing to loan their copy for this purpose, it will be appreciated. Won't you get in touch with your Editor. He will see that it is safely returned to you.

The Story of Anthracite

By W. J. COUGHTRY

*(A Paper read before our New York Chapter at their meeting
on Feb. 19th, 1943)*

Now that we are striving to keep comfortable temperatures in our homes, due to the shortage of oil and our Government is urging those who have turned to the lazy man's fuel—oil and gas—to convert to solid fuel as a heating agent, the present seemed to me a most appropriate time to recount the story of anthracite, or "stone coal," as originally termed, and of its transportation to the Metropolitan and other areas and to advocate greater consumption of this type of fuel, which I trust you will find illuminating.

Almost 115 years ago, or on December 5, 1828, there arrived in New York City from Rondout, N. Y., a small sloop, the "Toleration," with a tiny cargo of ten tons of a new and untried fuel. Its quiet, uneventful arrival opened the era of anthracite, or coal, if you wish, in the Eastern United States, particularly the Metropolitan district and the territory along the Hudson River.

This new fuel—Lackawanna Anthracite—had come from the coal beds at Carbondale, Pa.; had been hauled by wagon across the Moosic Mountains to Honesdale; was a part of the first shipment of coal to be transported through the Delaware and Hudson Canal, for its entire length of 108 miles, from Honesdale to tidewater at Rondout, now Kingston, N. Y., and was the first cargo commercially to reach the metropolis.

Nothing in the world, perhaps, seems more commonplace, or a matter of course, than anthracite fuel; yet it is the product of but a little more than the last one hundred years. Although there is a tradition that between 1750 and 1755 the Indians, near Nazareth, Pa., knew that anthracite would burn, the first mention made of coal on the early maps of that Commonwealth appears on one of Sunbury Manor, comprising all of the westerly side of the Wyoming Valley, opposite Wilkes-Barre, made by Charles Stewart in 1768, which noted the presence of "stone coal" in Ross Hill.

Obadiah Gore, a blacksmith, used it in his forge at Wilkes-Barre in 1769, and is believed to be the first white man to have developed Pennsylvania anthracite for heat.

The first recorded shipment of anthracite was two "Durham" boatloads from Mill Creek, near Wilkes-Barre, to Harris Ferry, now Harrisburg, from whence it was hauled by wagons to the arsenal at Carlisle for use by the Government of Pennsylvania in the manufacture of firearms for Revolutionary soldiers. This is also its first known industrial use and it seems fitting that it was used to forge the arms that made the United States of America a republic.

An effort to introduce anthracite in Philadelphia in 1792 failed, its vendor being unable to give it away and he was nearly mobbed for trying to impose upon the people with a lot of worthless "black stones" for fuel. With the exception of the Carlisle arsenal, blacksmiths seem to have been the only users of anthracite until February 11, 1808, when Jesse Fell burned it successfully in an iron grate in his home in Wilkes-Barre and found that it would serve as fuel, making a cleaner and better fire at less cost than wood.

Efforts to introduce anthracite in Philadelphia as a household fuel, made in the same year, again met with derision. In 1812, anthracite was sent to Philadelphia, the shippers taking their grates with them. This time many Philadelphians tried it and found it better than wood for house heating and cooking, and in that city anthracite had its first real market.

Prior to the War of 1812, our struggling manufactories were dependent upon bituminous coal imported from England and the wood and charcoal produced at home to feed their furnaces. When war cut off the English coal, wood and charcoal prices reached such high levels that men who knew the properties of anthracite urged its use as a substitute.

Foremost among these men were William and Maurice Wurts, two enterprising drygoods merchants prominent in the business life of Philadelphia, the originators of the plans and projects out of which grew the Delaware and Hudson Company.

Almost immediately they began to explore the Pennsylvania forests and streams, finally reaching the Lackawanna Valley, then almost an unbroken wilderness, where they purchased hundreds of acres of coal lands that now include Carbondale, Archbald and Olyphant. Simultaneously they examined the width and depth of the larger streams seeking to provide a means of transportation to what they needed—a city market. By 1822 they had mined at Carbondale about a thousand tons, but their efforts to market their product in Philadelphia by transporting it by teams over the Moosic Mountains and thence by arks and rafts down Jones' creek to the Delaware River met with disappointment and failure.

The Wurts brothers then turned to New York, a potential market in which anthracite was totally unknown, where they demonstrated its utility. With no direct means of communication with the anthracite fields it became necessary to create a practical means of transportation. Naturally their first efforts were directed towards canals, then the only recognized means for long distance transportation, and they formed a plan to cross the Moosic Mountains with a railway to the Lackawaxen River and to build a canal thence to the Hudson River at Rondout.

After William Wurts had covered the entire distance on foot and found the route feasible, he and his brother, Maurice, again visited New York and succeeded in interesting a number of influential men, including DeWitt Clinton, then Governor of the State, Philip Hone, later Mayor of the City, and others in the development of the enterprise.

On April 23, 1823, they secured a charter from the legislature of New York incorporating "The President, Managers and Company of the Delaware and Hudson Canal Company," with authority to open water communication between the Delaware and the Hudson Rivers, to purchase coal lands and to transport "stone coal" to the City of New York and other parts of the State.

Meanwhile the Wurts brothers and their associates in Philadelphia had taken the first actual step by securing a franchise from the legislature of Pennsylvania on March 13, 1823, to canalize the Lackawaxen River to provide a good descending navigation from a point near Wagner's or Rix's Gap to the Delaware. The interests of both groups being identical, each covering but a part of the proposed enterprise, they were ultimately combined, the New York company acquiring by purchase the rights and properties in Pennsylvania.

The qualities of anthracite as a fuel were publicly demonstrated on January 5, 1825, in a grate set up in the Tontine Coffee House, at the northwest corner of Wall and Water Streets in New York City, and two days later subscription books for the stock of the company were opened simultaneously in the Coffee House, at the Middle District Branch Bank in Kingston and at the Orange County Bank in Goshen, N. Y.

The stock was largely oversubscribed by early afternoon, which necessitated and brought about the first stock allotment known in this country. The first meeting of the stockholders followed on March 8, and four days later the organization was completed by the election of Philip Hone as President and John Bolton as Treasurer.

Two months later Benjamin Wright, under whose supervision surveys, begun in 1823, had been made, submitted his report to the Board of Managers recommending the construction of a canal from the Hudson River at Rondout, now Kingston, to the foothills of the Moosic Mountains at the forks of the Dyberry, now Honesdale, and of a good road, or railway, "the latter preferred," across these mountains to the coal beds at Carbondale.

On July 13, 1825, contracts were let for seventeen miles of canal construction and ground was broken at Mamakating, later renamed Wurtsboro in honor of the Wurts brothers; Philip Hone, the President of the company turning the first spadeful of earth. Contracts for construction of the remainder of the canal followed in quick succession and it was completed in October, 1828. It was the largest undertaking that had been entered into on this Continent by private enterprise, and its construction, together with the railroad across the mountains to Carbondale, which was completed a year later, was accomplished by manual labor in the use of axe, pick, shovel, wheelbarrow and wagons.

The canal, which upon leaving the Hudson, followed the Rondout Valley, crossed the Shawangunk Mountain, followed the valley of the Neversink to the Delaware, thence along and across that river to the Lackawaxen, which it followed to Honesdale. Its length was 108 miles, 32 to 36 feet wide at the water line, 20 feet wide at the bottom, and

minimum depth of four feet, affording capacity for boats carrying cargoes of not more than thirty tons. The canal was carried across the Rondout on a stone aqueduct supported by two arches, across the Neversink and smaller streams by wooden trunks on stone piers and abutments and across the Delaware by means of a dam and slack water, and was spanned by 137 bridges. From tidewater it ascended steadily for 35 miles, then its course was level for slightly more than 16 miles; then descended 58 feet and rose again 30 feet, all in Orange County, and reentering Sullivan ascended steadily for the remainder of the distance in New York. Entering Pennsylvania it ascended continuously to Honesdale, where its altitude was 972 and one-half feet. These ascents and descents were accomplished by means of 110 locks having lifts ranging from eight to twelve feet, the average being ten feet. These locks were 76 feet long and nine feet wide.

The first boat to navigate its entire length was the Orange packet, which left Rondout on October 16, 1828, carrying the Board of Managers, who were tendered a public reception upon their arrival at Honesdale.

The first cargo carrying boats carried twenty-five tons each, but by enlargements of the waterway in 1844, 1850 and 1862 boats carrying forty tons, 100 tons and from 125 to 150 tons were used.

The first anthracite to pass through the canal, carried in a fleet of ten boats, each carrying ten tons, left Honesdale in November, 1828, and reached Rondout on December 5.

As the fleet of tiny coal-laden craft glided slowly eastward through the quiet waters of this new channel of inland communication toasts were drunk by the Captains of the boats as they passed through various hamlets along its banks, many of which were brought into being by the undertaking. Of these, drunk as the squadron pushed its way through Sullivan and Ulster counties on December 3, the following are indicative of the sentiment toward the company, its founders, its officers and employees. At Cuddeback's, the captains burst forth in poetry. Captain Hickson of the "Superior," apparently leading the van, drank a toast to the company in these words:

"Vast and important is the work by them begun,
May they still prosper till with joy they see it done."

Captain Kortright, of the "United States," drinking to Maurice Wurts, one of the founders of the enterprise, said:

"With eagle eye he view'd with wisdom plann'd,
No obstacles his skill and power withstand.
Honor be his, and wealth at his command."

Captain Lomerau, of Company Boat No. 2, drank to Philip Hone, President of the company, in these words:

"Beloved, respected, honored may he be
Who did such honor to the company."

John B. Jervis, chief engineer, was acclaimed by Capt. Terwilliger of the "Oliver H. Perry" as:

"Possessed of wisdom, perseverance, skill,
Nicely to plan and promptly to fulfill.
Long may he live, respected, honored too,
And reap the just reward to merit due."

The approach of the squadron was heralded in Kingston and Rondout and many citizens and military gathered on the hills forming the banks of the Rondout to welcome its arrival. As the coal-laden craft came in sight with the Kingston band, which had boarded the leading boat at the tidewater lock at Eddyville, playing appropriate airs, they were saluted with discharges of musketry and with repeated cheers. The assemblage was addressed by several speakers, one of whom asserted that there were people within the sound of his voice who would live to see a hundred thousand tons of coal arriving by the canal in one year. Few of his listeners perhaps would have accepted in lieu of the speaker's "hundred thousand" the nearly two millions of tons later to pass through it annually when even Maurice Wurts, the Soul of the enterprise, in the wildest flights of his ambition dreamed only of being able to bring half a million tons to tidewater annually.

It was a part of the cargo of this squadron that was transferred to the sloop "Toleration," which made its epochal entry into New York City five days later and opened up a new era which enabled that city to more than double its population in a quarter of a century. A portion of her cargo was burned in the grates of the Western Hotel on Cortlandt Street in the latter part of January, 1829, which so demonstrated its free burning qualities that during the cold wave that followed a month later Philip Hone, in his diary, deprecated the fact that there was "no coal for sale in the city."

The supremacy of anthracite for heating purposes now firmly established, the managers of the infant enterprise eagerly sought new outlets for their product. Early in 1829 the managers had a range installed in the kitchen of the company's office and banking house at 13 Wall Street, New York City, on ground now covered by the Sub-Treasury building, to demonstrate its adaptability for cooking purposes. During the next year they redoubled their efforts for enlargement of the business by investigating the Boston market, sending samples to Providence, Rhode Island, and even shipped several hogs-heads containing anthracite to New Orleans.

In 1831 the use of anthracite was extended to steam production in the furnaces of the Ulster Iron Company, the steamboat "Victory" and the Walnut Street ferryboat "Experiment," and the company employed agents to introduce its use in manufactories and other establishments using steam engines and in blacksmith forges.

By 1836 the use of anthracite was extended to the Hudson River steamboats. On June 23 of that year the "Novelty," with the managers of the company and a party of distinguished guests, left her wharf in

New York at six in the morning and arrived at Albany twelve hours later, the first steamboat propelled by anthracite to make such a voyage.

In 1829 seven thousand tons of anthracite were moved through the canal to tidewater, marking the beginning of the still important industry of mining and transporting coal. At the end of the canal's first decade of existence the tonnage moved through it had increased to more than 120,000 tons, in 1846 to more than 500,000 tons, the greatest dream of Maurice Wurts, and reached its maximum of over 1,900,000 tons in 1864.

Although the canal was primarily constructed for the express purpose of moving anthracite, traffic became general in 1829. On October 7 of that year a packet service was inaugurated between Honesdale and Rondout, two boats, the "Luther Bradish" and the "Silas Wright, Jr.," elegantly fitted up, making three trips weekly.

While only a few of the canals achieved a moderate degree of financial success, they rendered immense service to the country not merely by furnishing avenues for transportation but by establishing a foundation for the great railway enterprises by which they have been succeeded and supplanted.

The construction of local railway lines as feeders to canals began in the thirties, and by 1847 503 miles had been built in the anthracite region alone. These soon expanded into longer and larger systems which, by 1870, crowded the canals from their dominant position as coal and freight carriers.

From that period the history of the Delaware and Hudson Canal is an uneventful one of decline and abandonment. The opening of new markets, which could be supplied throughout the entire year by the quicker and cheaper rail transportation, caused canal shipments to fall off yearly. Hence, the cost of canal transportation became too great to meet rail competition, and at the close of navigation in 1898 the canal was abandoned, its cost charged off, and after almost a century of honorable existence lost its place as an asset on the books of the company.

The last boat to pass through the canal, "No. 1,107," was loaded with anthracite and cleared Honesdale on November 5, 1898. It was indeed appropriate that the last boat to navigate it should, like the first, transport a cargo of anthracite.

As the history of coal is the story of industrial America, so is the history of coal the story of the development of rail transportation. Attracted by English progress in railways and in the development of the steam locomotive, the company management resolved to use this method of crossing of the Moosic Mountains that lie between Carbondale and Honesdale.

The rails and locomotives for the railroad were secured in England by Horatio Allen, an assistant engineer of the company. One of these locomotives, the history of which I have previously given you, after a steaming trial in New York City for the dual purpose of demonstrating the value of the new fuel and of the steps taken to supply it to the public, was shipped up the canal to Honesdale and made its famous trial trip,

driven by Horatio Allen, on August 8, 1829. The first car of coal passed over this railroad, which was of the Gravity type, on October 9, 1829.

In conclusion, let me add that this locomotive, the "Stourbridge Lion," an exact duplicate of which you all undoubtedly viewed at the New York Worlds Fair, although discarded after a second trial because its weight was too great for the track structure, was the first to turn a wheel on a railroad in the Western Hemisphere and is the progenitor of the massive and powerful locomotives that now haul over our great railway systems the millions of tons annually to keep our homes and firesides comfortable places in which to live and other commodities to keep our industries, now engaged in war work, going at full speed, as well as transporting our boys in the armed forces to and from training camps and to embarkation ports for movement by sea to battlefronts in foreign lands to make our Country and we, its people, Strong and Free.

The Mountain Division of the Maine Central Railroad

By C. F. H. ALLEN

While the Maine Central Railroad is essentially a Maine system of transportation, the Mountain Division leaves that state after about fifty miles, traverses New Hampshire and extends into Vermont, as far as St. Johnsbury; at one time, a branch even reached into Quebec province in Canada.

Chartered in 1867 as the Portland and Ogdensburg, it was originally intended to reach Ogdensburg at the foot of the Great Lakes, and capture a part of the huge lake traffic especially during the winter season when the St. Lawrence River is frozen. Portland backers envisioned Portland as rivaling or even replacing Boston as a shipping port. This rosy outlook failed to materialize, largely due to the opposition of Vermont interests to the construction of the lines now a part of the St. Johnsbury and Lake Champlain Railroad. Actually this line forms a part of the shortest route between Portland and Montreal, and also Chicago.

The rails were laid to North Conway, N. H., after four and a half years, and to Fabyan's in 1875. The construction of this last section was a remarkable accomplishment, for it traverses the White Mountains, the great scenic spot of New England. The difference in elevation between Portland and Crawford's (the highest point), is 1890 ft., of which 1369 are in the twenty-seven miles between North Conway and Crawford's. In fact, between Bemis (now, renamed Notchland) and Crawford's there is a rise of 116 ft. per mile for nine consecutive miles. There were two chasms to be bridged; the structures are known as Frankenstein Trestle (the present, steel one was installed in 1895) and Willey Brook Bridge.

The Portland and Ogdensburg (east of Vermont) was taken over by the Maine Central in 1888, and the line extended from Fabyan's to Scott's Junction to join with the Boston and Maine in 1889; prior to that, trains were operated between these points over the Concord and Montreal rails (later Boston and Maine). In view of this, it is especially interesting to note that the reverse is now the case, the Boston and Maine tracks having been torn up as an economy move. The Boston and Maine also operates now from Waumbek Junction to Coos Junction over the Maine Central, having abandoned their old, essentially parallel line from Whitefield. Scott's Junction thus had no further reason for existence; it was renamed Scott and made a flag stop only. The mountain division terminated for many years at Lunenburg, Vermont. In 1912 it leased the track from this point to St. Johnsbury from the St. Johnsbury and Lake Champlain Railroad.

The branch extending from Quebec Junction into Quebec province to Lime Ridge was a combination of smaller roads, the Upper Coos and the Hereford Railways, which had earlier been consolidated as the Upper

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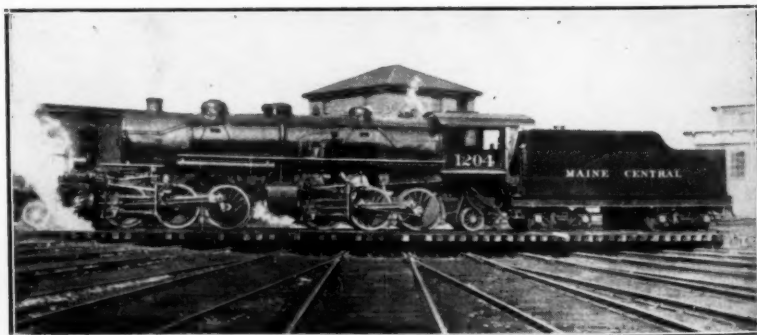
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Me. C. #321; ex Portland & Rutherford Falls #14, on extra freight, Bartlett to Beecher Falls, in 1917.



—Courtesy of Robert C. Baker.

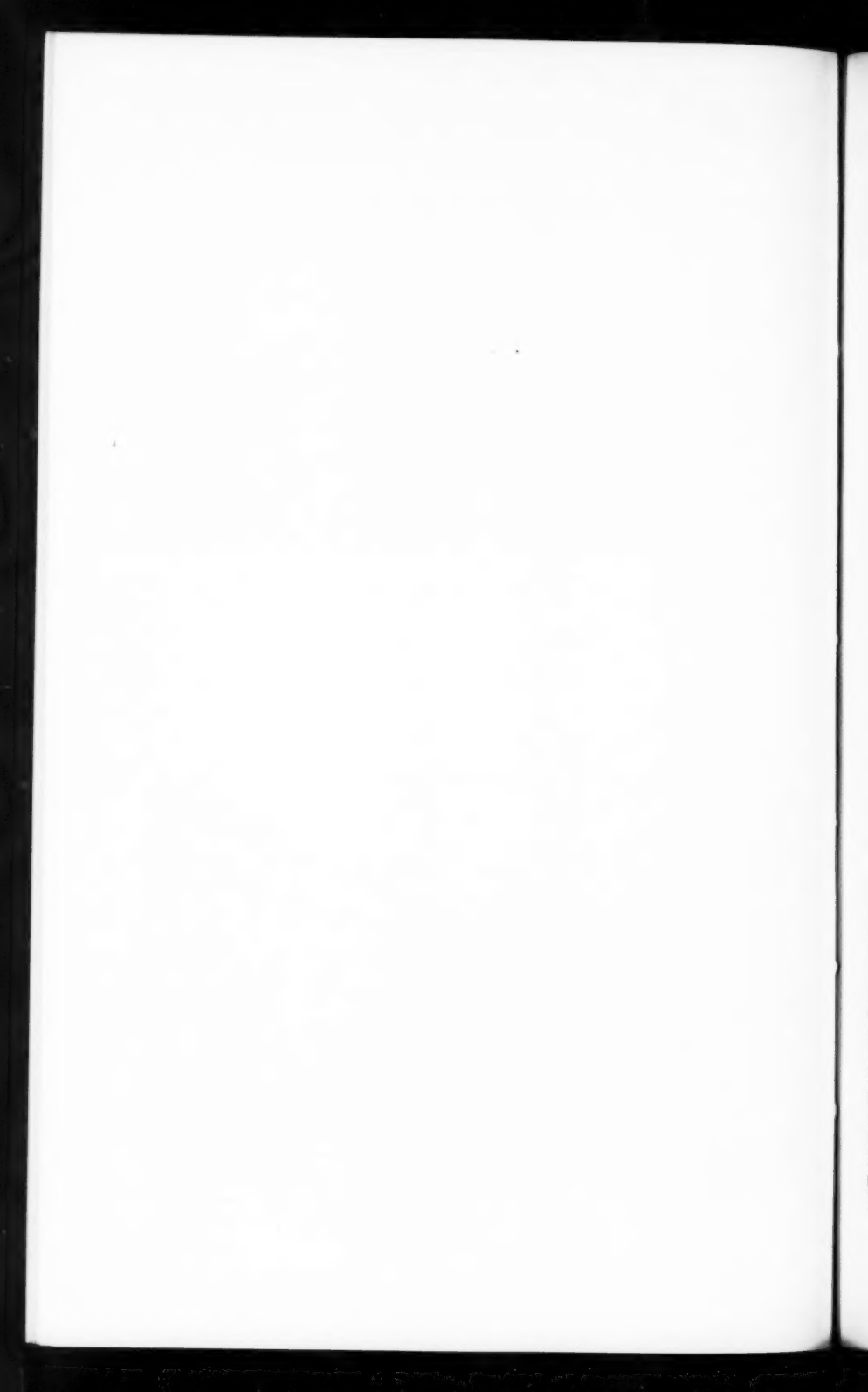
Me. C. #1204, ex B. & M. 3003, 1294.



Maine Central #380 entering Great Cut of Crawford Notch.



Train #160 on Frankensteintrestle.



Coos and Hereford Railway. Over this, connections were made with Canadian points by means of the Canadian Pacific at Cookshire Junction and the Quebec Central, now a part of the Canadian Pacific Railway, at Dudswell Junction. Through Pullman service was operated in the tourist season between Quebec City and Maine points. About twenty years ago, the track from Beecher Falls, Vermont to Melvina, was torn up and the rest sold to the Canadian Pacific, who promptly tore up the tracks below Malvina and above Cookshire Junction, except for a short spur connecting the limestone quarry with the ex-Quebec Central. The Canadian Pacific now runs two trains per week (Mondays and Fridays) between Malvina and Cookshire Junction. The order of stations on this line, going north from Beecher Falls were as follows: Hereford, E. Hereford, Paquetteville, Malvina, Auckland, St. Malo, St. Isidore, Clifton, Sawerville, Eaton Cor., Cookshire Junction, Brookbury, Pope's, Beckwith, Dudswell Junction, Lathrop, Dominion, Lime Ridge.

The Mountain division now consists of a main line of one hundred thirty-one miles from Portland to St. Johnsbury, Vermont, and a branch from Quebec Junction to Beecher Falls, Vermont. It joins or crosses lines of the Boston and Maine at Whitefield, Coos Junction, and Cumberland Mills, and the Canadian National (ex Grand Trunk) at Mason's; the old Conway Branch of the Boston and Maine joins it at Intervale. It formerly connected with the narrow gauge Bridgton and Saco River Railroad at Bridgton Junction, but with the abandonment of that line, this station will probably be closed. Most of the passenger and freight service (one a day each way) on this division has already been described in a separate article in Bulletin No. 59. The through freights (No. 375, 376) now start from Rigby. In addition a local freight runs week days, extra north and west from Bartlett to Beecher Falls as No. 378, and down as No. 377 to Quebec Junction. From this point, the engine runs over to Gilman, on the main line, to do any required switching. As the time taken is uncertain, the remainder of the schedule back to Bartlett is omitted from timetables.

As mentioned before, the hope of through freight traffic was the main reason for building the railroad that later became the mountain division. As this did not materialize, in order to operate the road successfully all these years there must have been a remunerative local traffic. The country penetrated served as a source of revenue by virtue of its natural products. Probably the largest in volume was the forest products; logs, lumber, wood pulp and paper. Other building materials comprised granite (of diminished importance since the extensive use of cement), limestone, and asbestos products. Natural ice was an important item until the introduction of artificial ice plants and mechanical refrigerators. Other miscellaneous bulk freight included coal and sulfur shipped from tidewater, and feldspar. Then there was the usual way freight, household furnishing, manufactured goods, and the like, most of which are now shipped by truck. The passenger traffic was lucrative for many years. This road is the most scenic in the White Mountain region. The news company's vendor on the main passenger train, No. 154, had this route for years, and always called attention to the points

of interest, giving facts and figures—a regular lecturer and guide. Passengers will recall his “nabisco and fig newtons. Either makes a nice lunch.”

The principal rail center is now at Bartlett, seventy-three miles from Portland and at the foot of the grades up Crawford Notch. At this point are an engine house, turntable, coaling facilities, and a wye, used for turning the 1200 series Mallet compounds. In the early days of heavy traffic, large wheel engines were replaced at this point by those with small wheels or extras added as required. Pusher service operated from Bartlett to Crawfords; this was usually a Mallet (No. 1203 for years), but tenwheelers were frequently employed in this way. The Mallets were replaced by Mikados, No. 606 being a familiar number. One of the rare occasions on which multiple pushers were used was fortunately observed by Mr. A. O. Wilkins, who succeeded in securing the accompanying photograph which shows Nos. 367, 370, 525 and 606 as pushers.

The Mountain Division has always been known for its safety record; it was a common impression that no passenger was ever injured in the Notch. The single track road was block signalled both ways from North Conway to Quebec Junction during the days of heavy traffic, but in recent years, with fewer trains, the signals below Bartlett have been discontinued. Trains are carefully inspected at Crawford's, and speed rules on the descending grades scrupulously observed. It takes only a few moments to pick up speed going down towards Bartlett, and as the road is practically a continuous curve, obedience to rules is essential. All eastbound (down grade) freight trains stop at Willey House and Notchland to see that the wheels are not overheated and that the train is all right. All bridges are approached with caution; the trains “just crawl” across Frankenstein Trestle and Willey Brook Bridge. The running time between points is specified by rule.

Very few accidents of any kind have been sufficiently serious to attract public attention. In the spring of 1918 owing to a defective air connection on an eastbound freight, the brakes on the train failed to operate, only those on the engine being applicable. The train got out of control and ran down the descending grades at increasing speed. The train would probably have come through safely, so well is the track constructed, but a tire came off one of the locomotive wheels (presumably the heat, due to the friction of the brake shoes, caused it to expand) and served to derail it on the long curve above Bemis. The engine crew were casualties. One of the cars was loaded with wheat, and the following spring there was a good stand of this grain in the vicinity.

In July of 1927 an extra freight was proceeding up the Notch, dragged by a Consolidation, No. 505. Near Willey House Station the boiler let go; the engine was blown off the track and turned around, pointing in the opposite direction. The engine crew were casualties. A few winters ago, two engines sideswiped near North Stratford, and one was pushed off the right of way and went through the river ice.

Though not any part of a through trunk line, this road has played an important part in several emergencies. The most important were

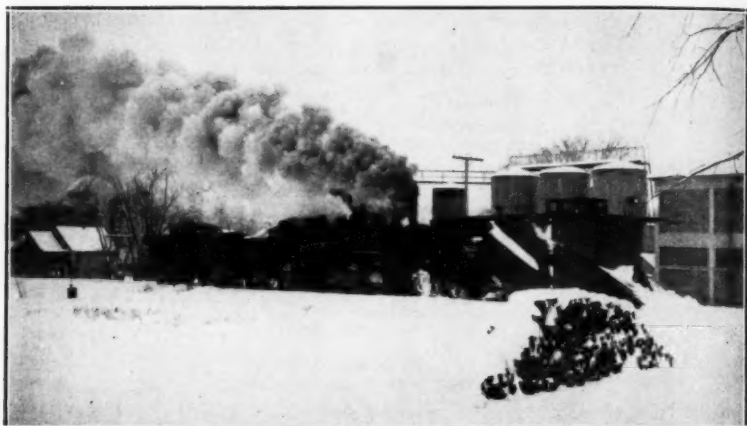
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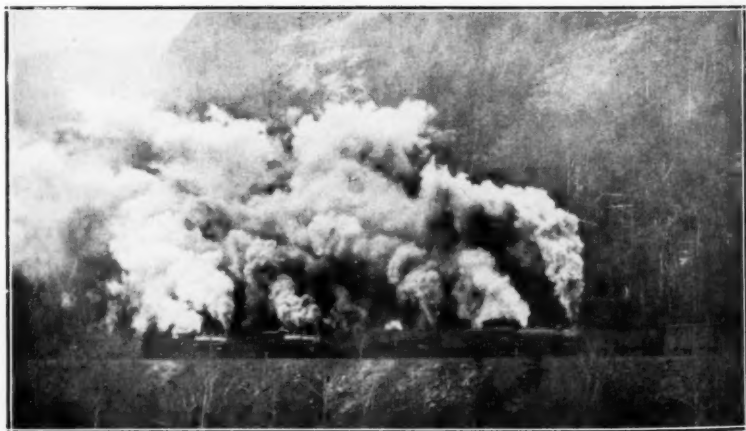
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—Courtesy J. S. Kendall.

Train #370X; Locomotive #370; Plow #70.



—Courtesy of A. O. Wilkins.

Four Pushers on a freight in Crawford Notch: #606, 525, 370, 367.

the famous floods (1927, 1936) when the Vermont, and Connecticut and Merrimac River lines were rendered unserviceable by unusual flood conditions. Damage to the Mountain Division was slight, by comparison, and all traffic between Boston and northern New England points was routed in this way. Milk and other perishables, so shipped, averted a dangerous shortage in Boston and vicinity.

This road recently made news since it was the only line by which ninety huge marine boilers 18 ft. high, and weighing 102,000 lbs. each, built in Schenectady, could be shipped to the Maine shipbuilding yards. Only a few relatively minor changes were necessary to allow passage of these. It illustrates the fact that there are limitations to what a railroad can carry in the way of freight, and how important it can be to have alternative routes available.

Acknowledgments

"Chronicles of the White Mountains" by Frederick W. Kilbourne. Houghton, Mifflin and Co.

"History of the St. Johnsbury and Lake Champlain Railroad," by J. S. Kendall.

C. E. Fisher; data on renumbering of locomotives.

Arthur H. Neal, former crossing-tender at North Conway.

The Start of the Hartford & New Haven Railroad

AND THE USE OF THE STRAP RAIL THROUGH MERIDEN

By W. G. SNOW

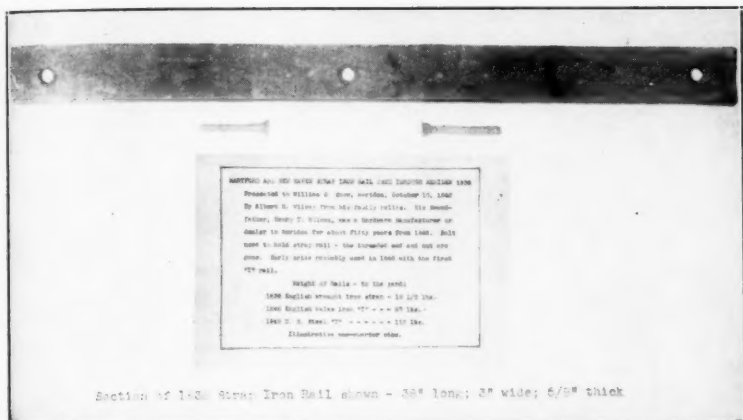
The Hartford & New Haven Railroad Company was chartered May 29, 1833. Note here that it was not called the "New Haven & Hartford Railroad," probably because of the more activity shown by Hartford people. Several months passed before any considerable work was visible. The authorized capital was \$1,000,000.00, shares \$100 each, and conditions seemed quite favorable as we look at it today. One provision was they were to be exempt from taxes until the profits should afford a dividend of 5% per annum.

In the May 29, 1856 issue of the "American Railroad Journal," it says: Ruling grades of this road are very low, a large proportion of road-bed level, or nearly so. In one instance only for a fraction of a mile is the graduation as high as 40 ft. per mile. At New Haven the road is 5 ft. above high water. Northerly the grade rises moderately with the exception of about a mile at Holt Hill, Meriden where the ascent is 30 ft. per mile. The main summit occurs near Beaver Pond, 4 miles north of Meriden and 150 ft. above tide water. Thence the road descends to the northward for 5 miles to Berlin flats. From this point there is a moderate ascent to Hartford, 11 miles, where the road is 36 ft. above tide water.

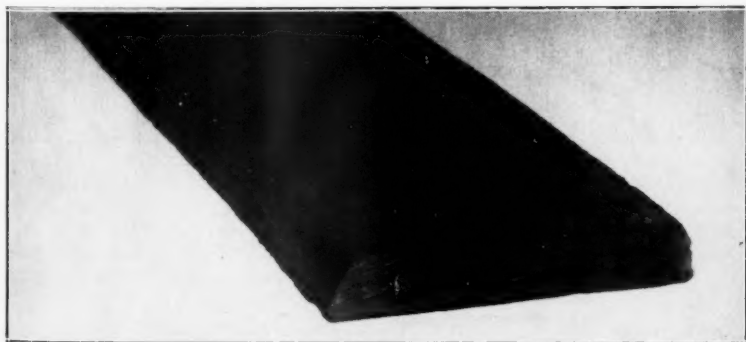
Preliminary surveys were executed in May and June, 1835. In September, 1835 books were open for subscription and in 3 days the sum of \$5,750,000.00 was obtained. \$1,000,000.00 was distributed and the company duly organized. Immediately afterwards the final survey and location were commenced and carried forward through ensuing winter.

In June, 1836 the grade of the first 18 miles—apportioned into 21 sections—and extending from New Haven to Meriden was let to contractors, to be graded for a double track and completed by May, 1837. Contract for iron specified a strap rail 13/16 of an inch thick. On the first of July, 1836 ground was broken at Meriden and on the 10th of October following the division between Meriden and Hartford was under contract to be finished by the middle of August, 1837.

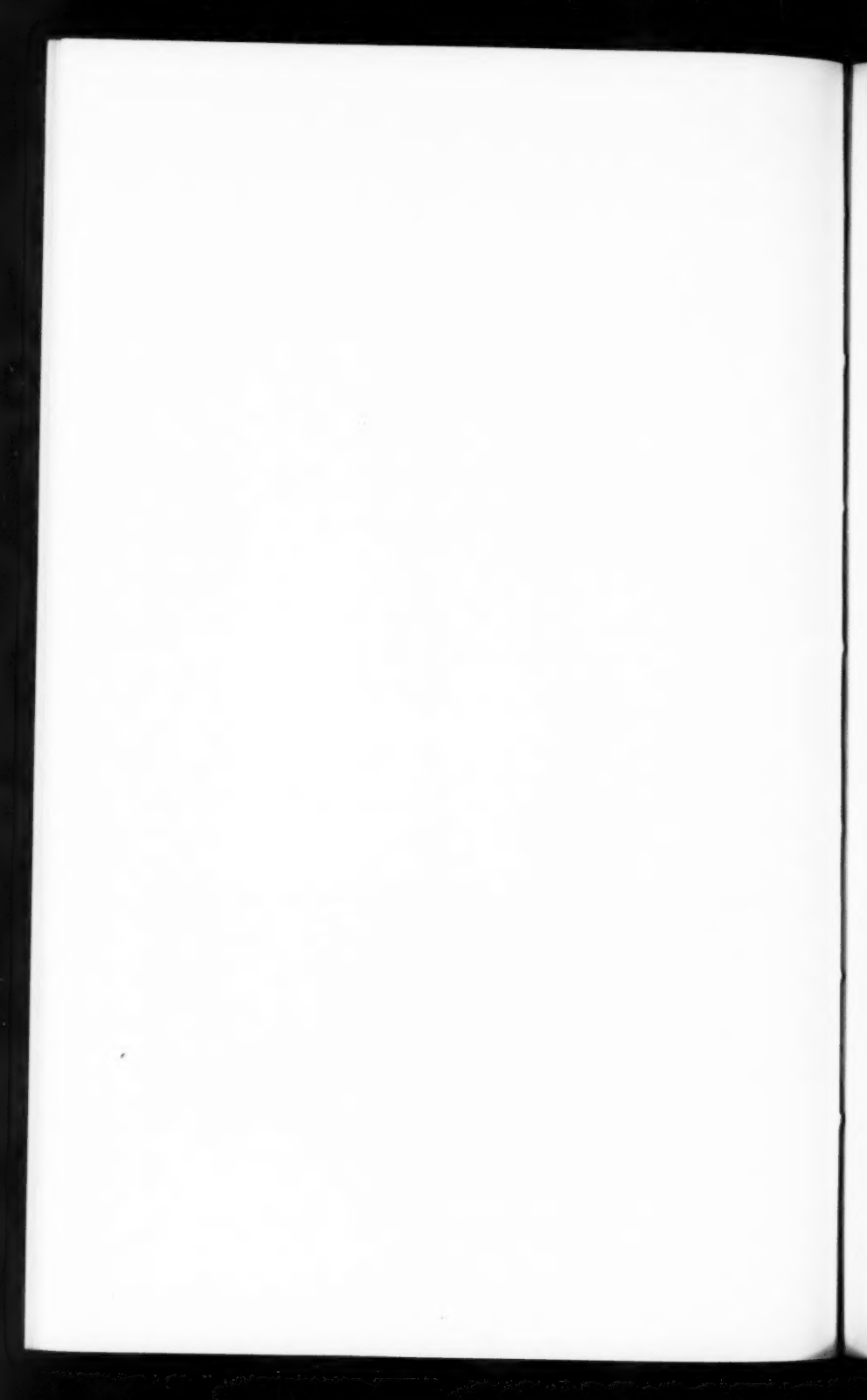
So far everything had been smooth and prosperous, but in the fall of 1836, stockholders began to be tardy in paying up their assessments and in the financial crisis which spread over the country the contractors were forced to suspend operations over the whole line. In the spring of 1837 prospects were so disheartening that the road in several places was inclosed, plowed and cultivated by farmers during the season. Appeals to the legislature and banks for funds were unsuccessful but finally small amounts of money were obtained monthly from principal share holders which added to a moderate amount of



Section of 1838 Strap Iron Rail shown—38" long; 3" wide; 5/8" thick.



End view of strap iron rail used by Hartford & New Haven Railroad, 1838. Actual size—showing bevel made by flange of wheels. From the collection of William G. Snow, Meriden, Conn.



private credit enabled the company to carry forward through 1837 the work in grading the roadbed.

By December, 1838 the road had been practically completed from a steam boat wharf (later called Belle Dock) at or near the Thomlinson Bridge in New Haven to Meriden.

Meriden had considerable interest in the new railroad, helping them in getting a proper location through the town, and satisfying all people concerned. Those that gave time and the most help in planning details here were Major Elisha A. Cowles and Judge James S. Brooks, prominent residents of Meriden, and their names were among the early directors selected.

The company had in October, 1838 only one 8-ton engine which was used for passenger trains only, the freight cars being drawn by horses. It was originally supposed that the latter could be advantageously used on rails by individuals as by the company and the first charter contained provisions authorizing the erection of toll houses, toll gates, and the appointment of toll gatherers. The rate of speed then adopted for passenger trains was from 12 to 18 miles an hour.

When the road was completed to Meriden, the trains ran on rails made of strap iron brought here from England, spiked or bolted to Georgia Pine timbers parallel under the rails, on white Chestnut cross ties which were reported to have been brought in from northern New England.

There has recently been unearthed what appears to be a sample of the strap iron rail first used, a section measuring only 38 inches long, 3 inches wide and $\frac{5}{8}$ of an inch thick. One side of the strip clearly indicates a bevel worn by the flange on the car wheels. This section is pierced with round holes with a beveled opening indicating that something other than a regular spike was used.

With this piece of strap iron was a round bolt with a flanged head fitting the openings, the end which probably carried a thread was missing. There was also a square spike somewhat similar to what was used on the early "T" rails, although the head wasn't properly flanged to use with that type of rail. This specimen was presented to the writer in October, 1942 by Albert H. Wilcox. He stated he found the pieces in a barn located at his house which has stood there for over 75 years, although the rail has not been there all of this time, it having been given him by one of the family about fifty years ago. Mr. Wilcox's family had been identified with iron work in Meriden for a great many years. His Grandfather, Henry T. Wilcox, was a hardware manufacturer about 75 years ago, later a dealer in hardware for about 25 years prior to his death.

This type of English wrought iron strap rail, according to records available weighed $16\frac{1}{2}$ lbs. to the yard and the "T" rails imported from England which replaced these strap rails about 1845 or 1846 weighed 57 lbs. (or 58 lbs.) to the yard.

The locating of this first specimen is directly traceable to information given me by Sidney Withington, Electrical Engineer, New York,

New Haven & Hartford Railroad Co., when last summer he gave me the specifications on the first strap rail. These specifications appeared in an article regarding the early railroad through Meriden in the Meriden Record of September 31. Mr. Wilcox saw the article and noticed the piece in his collection of "scrap" and telephoned his suspicions which I confirmed on investigation.

Since the specimen was located, still another piece has turned up which has every indication of having been used for railroad purposes. It is at present in the vault of the Curtis Memorial Library here in Meriden and is a little over six feet long, $2\frac{1}{2}$ in. wide and $\frac{3}{4}$ in. thick. It is pierced by four square holes generously beveled at the top so as to appear as if it was used with a square spike for fastening. The small spike referred to earlier, while it is the right shape, is a trifle too large to be used with that section. The specimen in the Curtis library was presented to them by William H. Catlin in Sept., 1914. Mr. Catlin was for practically all his life connected with the Meriden Savings Bank and its Secretary and Treasurer for 30 years before his death in 1922.

This piece presented by Mr. Catlin carries a tag reading as follows:

Part of the first rails used on the Hartford & New Haven Railroad in 1839. This strip was bolted to a long timber. Presented by the late John Yale, handed to Edward H. Yale then to his son, Allen R. Yale, then to his widow.

The John Yale referred to was a descendant of the Yale family who came to Meriden about 200 years ago and had a farm in Meriden and lived there during his life about three miles north of the center and about half a mile east of the territory which something over one hundred years ago the railroad started to run. Edward H. Yale was a descendant and Allan R. Yale the son lived in that same locality as a farmer until about 1910. His widow who presented this rail to Mr. Catlin lived until about 1912.

This specimen in the library does not show quite so clearly the bevel as the early specimen. The second specimen is referred to as one of the first rails used in 1839. This might be correct because it was a heavier rail as to thickness (although narrower) and a square spike which was used with it probably took the place of the round bolt used on the first specimen, and this first type may not have been used beyond Meriden. There is a tradition that when the early trains ran over the strap iron rails, the rails sometimes worked loose and came up through the floors of the cars with serious results to the passengers. They were sometimes called "snakes." With the experience they had between New Haven and Meriden possibly the Hartford & New Haven Railroad thought it wise to use thicker straps.

This second specimen had one other difference from the early one. On one end it was notched in 1 in. deep and $1\frac{1}{2}$ in. wide. The rail it joined probably had a tongue that filled the groove. Probably this was so that the two ends would keep in line and make a better chance of safety in traveling.

The next year (1839) after the road was opened to Meriden, it was finished to Hartford and through trains to Hartford from the steam

boat landing in New Haven were run two a day each way, with a fare of \$1.00 about the same as was in force most of the time up to about six months ago.

In 1845 the company commenced to relay their track between New Haven & Hartford with a heavy "T" rail which was mostly finished in 1846. In 1848 arrangements were completed for exchanging business with the New Haven & New York road. In 1851 the work of laying double track was commenced and vigorously prosecuted until the close of the year when 24 miles had been put in operation. This was continued through the following season and completed throughout in 1853.

Parley Ide Perrin

By CHAS. E. FISHER

At this late day, the student, either of railway history or of manufacturing, is confronted by a woeful lack of information due to the destruction of records or failure in their preservation. The history of many of our early locomotive building firms falls in this category and there is still much information that is to be desired.

The Taunton Locomotive Works is no exception to the above although an account of their history was briefly given in an article that appeared in our Bulletin No. 15. It has been the privilege of the writer to examine the personal records of Mr. Perrin, a man long associated with the Taunton Locomotive Works.

Parley Ide Perrin was born March 1, 1812 in Seekonk, Mass. Before his death, he prepared for his granddaughter a brief autobiography which is so quaintly interesting that it is reproduced in full.

"I finished my apprenticeship as a machinist on cotton machinery in the spring of 1833 and for the next two years was employed on cotton and other machinery. In the summer of 1835, I engaged with the Locks & Canal Company of Lowell, Mass. Their business was the manufacturing of cotton machinery, calico printing presses and locomotives of the Stephenson pattern. Major Whistler was the principal director in the locomotive department. My principal business was on printing press work, but occasionally some parts of locomotive work.

"In July of 1836, I was informed that Seth Boyden, Esq. of Newark, New Jersey, a man of remarkable ingenuity and perseverance, who had succeeded in perfecting malleable cast iron and who also had experimented and brought the patent leather enterprise to a successful and profitable issue. (For the life of Seth Boyden, the reader is referred to our Bulletin No. 46.) Being informed that he was about to engage in the manufacture of locomotives and that a man of his genius would not follow in any beaten track, but would attempt some new design, I went to Newark and engaged with him. The work shop was very destitute of suitable tools for the business.

"The first work was the construction of a large lathe for the turning of driving wheels. The driving wheels were cast iron flange wheels, $4\frac{1}{2}$ feet in diameter, the outside face of hub was 18" in diameter with a fine scraped polished surface. A truck with four cast iron flange wheels, 31" in diameter, the outside end of hub had a scraped polished surface 10" in diameter to correspond with the drivers. The cylinders were 8×24 " placed at an angle with the rail. The valve motion worked by an outside crank pin from which was obtained both forward and back motion. The engine had a straight back boiler, about 6.75 feet of grate surface, 220 copper tubes $1\frac{1}{4}$ " diameter, 48" long. The steam was taken from a flanged projection six inches high and about 15" in diameter over the fire box (practically no steam dome), one pair of cast iron driving wheels with flanges, placed in rear of firebox (no wrought flanged tyred wheels).

This locomotive was completed in the summer of 1837 and was placed upon the Morris and Essex Railroad.

"For the next six years my time was about equally divided between stationary engine work and running a machine shop on general repair work. In the spring of 1842 it became necessary to dispose of all machine work and for about three years to attend to my farming interests.

"In the spring of 1846, Mr. W. W. Fairbanks retired from the firm of Fairbanks, Bancroft, Barstow and Company of Providence, R. I., engaged in steamboat engine and repair work and with whom I was then employed. Mr. Fairbanks organized the Taunton Locomotive Works with a capital of \$50,000.00. In June of that year, at his request, I took charge as foreman and draughtsman of the infant works with neither shop nor tools except a few second hand lathes. Among the stockholders was Mr. George S. Griggs, then Master Mechanic of the Boston & Providence Railroad and a director in the new company.

"The first business was to build a steam engine to run the new shop, the foundation of which was then being laid. The castings for the steam engine he obtained from his old shop, with no plan or drawing to work by. The engine, however, was completed in time to start the new shop in December. To secure an early completion of the first locomotive, Mr. Griggs kindly furnished nearly all the castings from his patterns. With the assistance of Mr. Benjamin F. Slater, a thoroughly practical engineer, from Mr. Griggs' railroad shop in Roxbury, the first locomotive was completed. This locomotive had 11x16" cylinders, four five foot drivers and a four wheel truck. It was run out for trial on the Taunton Branch R. R. on May 19, 1847 and named "Rough and Ready". A more appropriate name could not have been selected. She was indeed rough and ready!

"This was a time of small beginnings and prosecuted under difficulties. It was soon found that some more accurate method of quartering the crank pins for coupled drivers was necessary. I think it was in 1849 that I planned and constructed a machine for that purpose which proved a very great improvement over the previous method and it was the first machine of the kind that had been built.

"The first locomotive that ran west of the Mississippi River was built here in 1852 for the Missouri Pacific Railroad. This locomotive was shipped on a sailing vessel by way of New Orleans and was landed at St. Louis.

"During my connection with these works about one thousand locomotives have been built and distributed in various parts of the country, some in South America, Canada and some in nearly every state of the Union. I have been in the employ of the company in various capacities required in the designing and constructing of locomotives. I have been a stockholder for 42 years, a director for 23 years and Agent and Treasurer for eleven years."

It is not the purpose of this article to touch at any great length on the locomotives built at these works, much as we would like to. That has

already been done in one of our previous publications. There are, however, some new facts presented in Mr. Perrin's records.

The first five engines were completed as "Lot No. 1", two were sold to the Eastern (Mass.) R. R. and three were sold to the Providence & Worcester R. R. Mr. Perrin states the castings for the first locomotive were furnished by Mr. Griggs of the Boston & Providence R. R. An old daguerreotype of the "Lonsdale" indicates great similarity with the Griggs' engine and we suspect that he furnished the castings for all of the engines in this lot. Further reference is found in the records relative to the use of Mr. Griggs' patterns.

Locomotives today are built on order. Not so nearly one hundred years ago. Locomotives were built and then the sale had to be completed but between the time of completion and the date of sale the Taunton Locomotive Works had a novel scheme. In the case of the "St. Lawrence", completed on May 29, 1848 we find the following notation—"Ran on the New Bedford & Taunton R. R. until June 23rd, then delivered to the Western (Mass.) R. R." Likewise the "Providence", completed June 22, 1848—"Ran on Taunton Branch R. R. until Sept. 27th, then delivered to Western R. R." Between 1847 and 1855 the records contain similar notes of engines being in service on either of these roads until delivery was made. The Taunton Works benefited in that they received a rental of the engine until it was sold, the two Taunton roads benefited in that their motive power requirements were kept to a minimum though it must have been a bit exasperating at times to the Master Mechanic to have some one come across the tracks from Mr. Fairbanks' office and request the return of a certain engine that day because she was sold, and the purchaser benefited in that the locomotive was nicely broken in after being returned to the Taunton Works for a final grooming.

Mr. Perrin has made mention of Mr. B. F. Slater assisting in the construction of the "Rough and Ready." Apparently he remained with the Taunton Works and was employed as a valve setter. His tragic end is recorded against T. L. W. #161 built for the Cleveland, Columbus & Cincinnati R. R., the "R. Hilliard", April 22, 1854. "The rear driving wheel marked with a * in two places on the face of the hub was one of the two wheels that fell over and hurt B. F. Slater on March 22nd, so that he died the next day."

The panic of 1857, followed a few years later with the outbreak of the Civil War, were difficult times for the manufacturer. The record of construction during these years is of interest:

19 locomotives built in 1856
22 locomotives built in 1857
10 locomotives built in 1858
19 locomotives built in 1859
11 locomotives built in 1860
2 locomotives built in 1861
8 locomotives built in 1862

True, there were some rebuilt during the above years but they were lean times indeed. It appears from the records of Mr. Perrin that the

Taunton Works were actively engaged in the manufacture of stationary boilers. His first entry is dated November, 1846 when two boilers were constructed for George Mathews, Agent of the Cochecho Mfg. Co. One was to have copper tubes, the other iron, the price 15c per pound for boilers complete, cost of copper tubes extra. Note that this is prior to the construction of the first locomotive. Even William Mason, in 1847, purchased two boilers from the Taunton Works to be used in his establishment across the tracks. The following items cannot help but fail to be of interest because they indicate another side of the activity of these works.

July 12 1847—Boston & Providence R. R. Two locomotive boilers @16c per pound and the copper tube sheet extra.

Oct. 11 1847—Boston & Providence R. R. Two locomotive boilers @16c per pound, tube sheets extra. All these boilers without tubes.

Oct. 14 1847—Taunton Branch R. R. One locomotive boiler agreeable to specifications given by Mr. Cook @16c per pound—copper tube sheet extra.

Apr. 10 1848—Messrs. Crocker & Co. One boiler for S. S. "Great Western" @11c per pound.

June 1848—Boston & Providence R. R. Two boilers and tenders @16c. Copper furnace extra.

Feb. 10 1849—Machine for boring crank pins for locomotive engine driving wheels at right angles at the same time, etc. for Reading R.R. \$500.00.

Dec. 17 1851—Taunton Branch R. R. New firebox for engine "Rocket" to be made of copper.

Apr. 16 1853—Boston & Providence R. R. One locomotive boiler, wt. 7703 lbs. One locomotive tender for same road.

Mar. 1853—Two locomotive boilers for A. Latham & Co., White River Jet., Vt.

June 1855—Reading R. R. Dimpfel boiler, 204 brass tubes. Cost without tubes 17½c. Wt. without tubes 11522 lbs.

Apr. 1857—Memphis & Charleston R. R. One locomotive boiler 48" dia. 24' long with 2 16" flues, no steam drum, wt. 8000 lbs.

July 1 1858—Scrap squeezer for blubber. P. S. Wilcox, New Bedford, Mass. Wt. 1495 lbs., cost \$263.50—"and we ought to have \$300.00 to build another." Total wt. 1869 lbs.

July 13 1861—Montreal & Champlain R. R. One bolt heading machine. Wt. 570 lbs. Cost \$107.89. Sold for \$100.00.

Sept. 2 1861—J. P. Morgan, N. Y. Rifled 1000 breech loading carbines and reamed the breech.

Nov. 26 1861—New Jersey Central R. R.—One steam hammer.

The above are only a few items that relate to railroad work, save the "scrap squeezer for blubber" but it would be impossible to include over one hundred other items of boiler and machine construction.

In his careful and methodical way, Mr. Perrin tells of the building of the machinery for the sloop "Sacramento."

Jan. 8 1862—Philip Mars arrived from New York to assist in building the machinery for the sloop "Sacramento"—Sloop of War.

Mar. 8 1862—Received notice from the Commander of the Portsmouth Navy Yard that the "Sacramento" would be ready to launch about the middle of April.

Apr. 28 1862—The sloop "Sacramento" launched this day at Portsmouth, N. H.

June 5 1862—Received from Washington the proper certificate signed by B. F. Sherwood and M. Lenthal, the first payment on the "Sacramento"—\$23400.00.

July 30 1862—"Sacramento" went into dry dock to receive machinery.

Sep. 20 1862—Proved the last boiler at 60 pounds. Mr. Lawton signed the third certificate for payment of \$23400.00.

Jan. 15 1863—Fired up "Sacramento" first time this evening.

Feb. 13 1863—"Sacramento" got under way at 5:30 P. M. from Portsmouth to Fortress Monroe on her trial trip. Boggs, cap't., Benham, Lt. Comdr., John Yates, Chief Engineer. Stopped at 5:40 P. M. to let off Pilot.

Feb. 14 1863—Ran all day making about 40 revolutions per minute.

Feb. 16 1863—Calm and pleasant making 50 revolutions per minute—8 knots.

Feb. 17 1863—Came to anchor at Hampton Roads at 9:50 P. M. Registered 196860 revolutions. (The notes record a speed as high as $11\frac{1}{2}$ knots—65 revolutions.)

With the close of hostilities, we find the Taunton Works returning to the manufacture of locomotives. In addition to their construction of new locomotives we find that they were active in repairing locomotives. Thus in the decade between 1872 and 1882 we find the Boston, Clinton & Fitchburg had the Taunton Works repair ten of their locomotives and other roads mentioned in Mr. Perrin's records are the Boston, Hartford & Erie; Providence, Warren & Bristol; Hanover Branch and Bennington & Rutland roads.

We find an interesting record of the old "Acushnet" received from the B. C. & F. in part payment for a new engine. The items include a copper firebox, wt. $1808\frac{1}{2}$ lbs. and a total, not including bell, of 850 lbs. of brass. The boiler of this engine was lagged with brass. Copper and brass valued at $12\frac{1}{2}$ c per lb. The reclaimed scrap value of this engine was \$1026.36 and the cost of cutting up this engine was \$962.97.

We find a memorandum stating that Mr. W. W. Fairbanks resigned as Agent and Treasurer on Sept. 25th, 1861 to take effect October 1st next. Mr. Harrison Tweed had been chosen Treasurer on December 24, 1858 and he succeeded Mr. Fairbanks in the dual office. Mr. Perrin succeeded Mr. Tweed on Aug. 1, 1877, retiring in 1888 having been with the Taunton Works forty-two years.

As a boy, the author remembers "old Mr. Perrin" as he was affectionately called by them. His interests, other than the Taunton Works which were his chief interests, were wide. He was active in civic affairs

and he took great pride in Taunton. He was a devoted churchman and again we find in one of his notebooks the measurements needed for a new carpet in the meeting house. A product of the farm, he, like many other men developed genuine mechanical ability in the hard school of experience and after living a useful life during a period of industrial development of this country, he passed away in Taunton on February 6, 1896.

In closing the author wishes to express his appreciation to Mr. Chester S. Godfrey, grandson of Mr. Perrin for the opportunity of examining these old records and for permission to reproduce same. Mrs. Godfrey also has the thanks of the author, not only for knowing the location of these records but many years ago she labored with him through all the troubles and intricacies of Algebra.

Pittsburg, Shawmut and Northern

By WINFIELD W. ROBINSON

The history of The Shawmut Line, the short title which has been adopted by the company and by which the railroad is generally known, is the tale of a number of small independent roads which, over a period of less than twenty years, were gathered together into one system.

As the earlier of these short lines in New York State antedate by a few years those in Pennsylvania, we will take up in this article the New York roads first. In chronological order of organization they are:

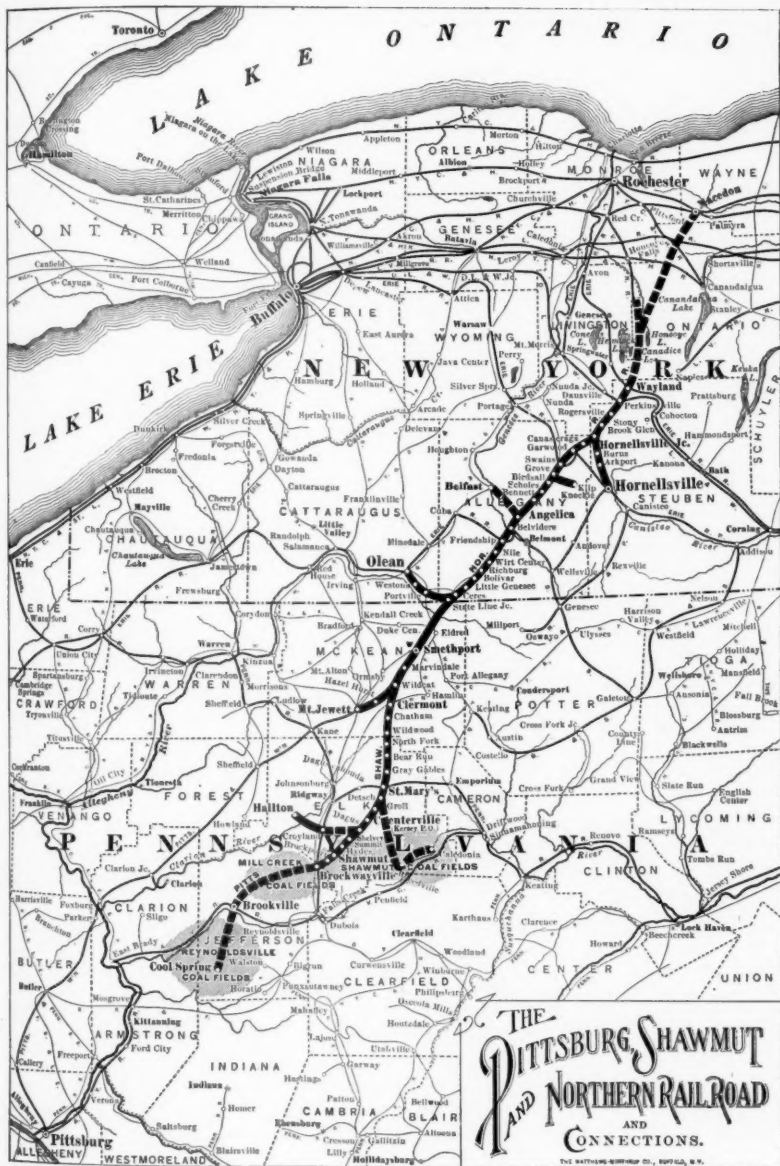
THE OLEAN RAILROAD COMPANY. This company was incorporated May 2, 1881 to construct a narrow gauge steam railroad from the city of Olean in Cattaraugus County to the village of Bolivar in Allegany County, passing through the then thriving industrial village of Portville, following the Allegany River from Olean to Ceres and then the Little Genesee Creek to Bolivar, a distance of eighteen miles. The purpose was to tap the extensive oil fields which were then being developed in southern Allegany County. The promoters of this railroad were bankers and merchants of Olean. Construction was completed in the autumn of 1881.

THE FRIENDSHIP RAILROAD COMPANY. Organized May 12, 1881 by business interests of the village of Friendship to construct a narrow gauge steam railroad from that community, passing through the prosperous village of Richburg, to Bolivar, a distance of thirteen miles.

The road was built from the south, a connection with the Olean Railroad, along the east side of the range of hills in the valley of Little Genesee Creek, crossing over the summit through what is known as West Notch, thence northerly down the hills until it reached the low lands in the valley of Van Campen Creek at the hamlet of Nile, following the creek to Friendship. Construction was completed early in the autumn. Asher W. Miner, president of the bank at Friendship, was the head and moving spirit in the railroad.

The following item recently appeared in one of the local Allegany County newspapers under the heading of historical events:

"Oil had been discovered only a few months when a boom town of several thousand sprang up at Richburg with no means of getting in or out except by tortuous mud roads that wound through the valleys to Portville and Wellsville. The nearest railroad connection was with the Erie at Friendship, twelve miles away and over the steep West Notch hill which made transportation of heavy drilling equipment practically impossible. So with pioneering courage and an eye to the lush profits through tapping this rich oil country the bankers and business men of Friendship financed the Friendship railroad to the Allegany oil fields at about the same time their brethren in Olean were constructing the railroad from Olean to Bolivar. The survey for the Friendship road called for a climb of seventy feet to the mile in wide "S" curves to surmount the 300-foot high watershed."



ALLEGANY CENTRAL RAILROAD COMPANY. This company was organized September 29, 1881, by Angelica interests, with authority to construct a narrow gauge steam railroad from the village of Friendship to the hamlet of Swains, all in Allegany County, a distance of thirty-one miles. Abijah J. Wellman, vice president of the bank at Friendship, was president of the railroad, but was soon succeeded by Frank Sullivan Smith, an attorney of Angelica.

The road was built through Belvedere, north along the west bank of the Genesee River to a point about a mile south of Transit Bridge where it crossed the river on a wooden trestle, then followed Angelica Creek to the village of Angelica, thence following Black Creek to near the hamlet of Grove, where it climbed, twisting and turning, over the high hills until it reached Swains in the Canaseraga valley.

November 21, 1881 the Allegany Central was consolidated with the Olean and the Friendship railroads under the title of the Allegany Central Railroad Company, with narrow gauge trackage all told of fifty-eight miles. The new company elected Archer N. Martin of Summit, N. J., as president, with Frank Sullivan Smith as vice president and the Olean and Friendship people continued their financial connection.

Conductor John J. McLaughlin* of Olean once told me that the Allegany Central had seven narrow gauge locomotives, all new when they came to the road, which remained in service under the several successors to that company until the line was made standard gauge. He was uncertain as to the builders of these engines, but remembers that one was a saddle tank affair and the others rod-driven and up-to-date for that period. A building containing the Shawmut's mechanical department's offices was burned many years ago and all the old records were destroyed so that there is now no means of securing through the present company any information on these original engines. Such data as appears in the appended roster is taken from old files of the American and Baldwin locomotive companies.

The annual reports filed by the Allegany Central and its successor companies with the Board of Railroad Commissioners of New York State all show seven narrow gauge locomotives but no description is given of them. When the last narrow gauge section was widened these engines were all cut up for scrap in the shops at Angelica.

LACKAWANNA & PITTSBURGH RAILROAD COMPANY. This corporation was organized November 1, 1882 by interests back of the Allegany Central, to construct a standard gauge steam railroad from a point called

* Mr. McLaughlin is the only person who commenced with the railroad at its very beginning and remained with it continuously until the present time. He was born in Friendship January 1, 1866. When fifteen years of age he went to work as a water carrier for the gang building the Friendship railroad. He then worked in the office of William O. Chapman, first superintendent, until seventeen years old. Then he became a brakeman and was promoted to conductor April 4, 1886. He was in passenger train service almost entirely. January 1, 1938, at the age of 72, with almost fifty-seven years of service with one railroad, he was pensioned under the Railroad Retirement Act. He was and is a very popular man. No person is better known or has as many friends from one end of the Shawmut line to the other than "Jack" McLaughlin.

Belfast Junction, near the hamlet of Rockville in Allegany County, on the canal railroad*, to a connection to be known as Wayland Junction on the Delaware, Lackawanna & Western near the village of Perkinsville in Steuben County.

The company built from Belfast Junction to Angelica, seven miles, then laid a third rail along the narrow gauge line from Angelica to Swains, and then constructed from Swains to Wayland Junction, securing trackage rights over the Lackawanna to the Wayland depot, a little over a mile. It also secured trackage rights from Belfast Junction to Olean, over the railroad* following the old Genesee Valley canal.

The new company absorbed the Allegany Central, with Archer N. Martin and Frank Sullivan Smith continuing as president and vice president, respectively, and for many years both standard and narrow gauge trains were operated over the section between Angelica and Swains.

The company leased, August 10, 1883, from the Rochester, New York & Pennsylvania Railroad, a section of track commonly called "The Swains Branch" from Swains northwesterly through the Canaseraga valley to Nunda Junction, fifteen miles, and it was operated as part of the Lackawanna & Pittsburgh.

Early in 1887 the company also leased the Rochester, Hornellsville & Lackawanna Railroad, the construction of which had been financed by Lackawanna & Pittsburgh interests, from Hornellsville Junction (now Moraine) to what is now the city of Hornell, fourteen miles.

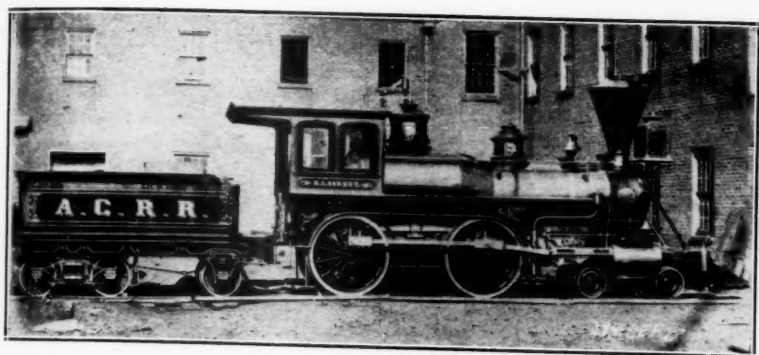
All told, in the latter days of its existence, the Lackawanna & Pittsburgh operated the following lines:

Belfast Junction to Wayland Junction (standard gauge)	45 miles
Angelica to Olean (narrow gauge)	42 miles
Swains to Nunda Junction, lease (standard gauge)	15 miles
Hornellsville Jct. to Hornell, lease (standard gauge)	14 miles
Belfast Junction to Olean, trackage (standard gauge)	27 miles
Wayland Junction to Wayland, trackage (standard gauge)	1¼ miles

March 24, 1883 the Allegany Central was officially merged into the Lackawanna & Pittsburgh, with charter dated from June 1, 1883.

There was a famous train on this road called the "Cannon Ball". Although several railroads since that time have had trains similarly called, the L. & P.'s train is believed to have been the first usage of that name. On the cabs of the locomotives the name Cannon Ball was painted. This train carried Pullman sleepers between Olean and Wayland, operated over the Lackawanna to Hoboken. Old residents of Allegany County still refer to the abandoned right of way between Belfast June-

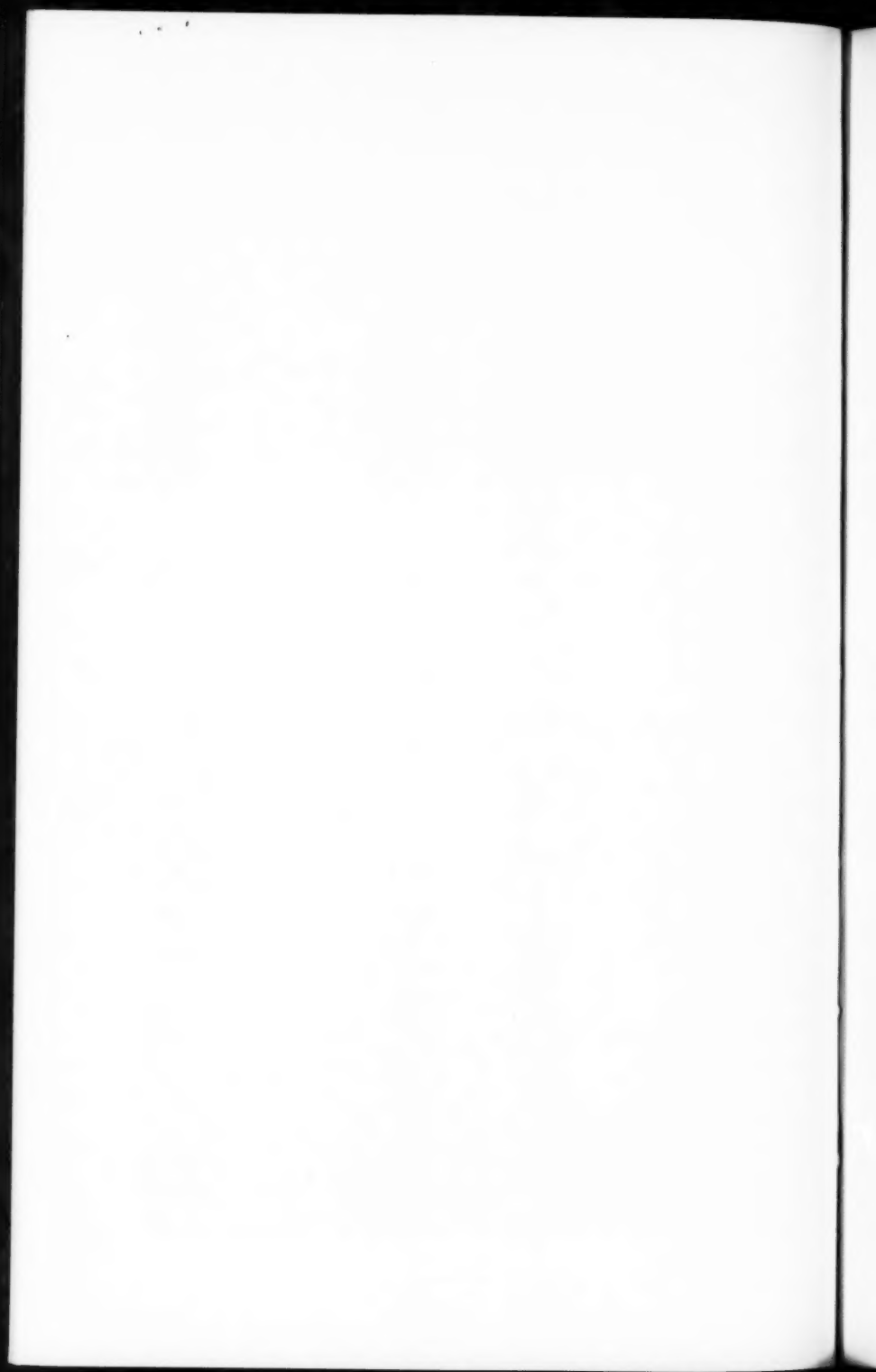
* This railroad ran between the cities of Rochester and Olean and was originally the Rochester, Nunda & Pennsylvania, incorporated in 1870, and was built in sections, rather slowly, under charters of numerous subsidiaries. In 1877 it was reorganized as the Rochester, Nunda & Pittsburgh, in 1881 as the Rochester, New York & Pennsylvania, in 1883 consolidated with the Buffalo, New York & Philadelphia, then the new consolidation was reorganized as the Buffalo, New York & Pennsylvania, then became the Western New York & Pennsylvania, finally passing into the hands of the Pennsylvania system. That portion from Rochester to Olean is now called the Rochester branch.



Allegany Central "S. C. Dorsey" #3. Mt. Savage, 1881.



Allegany Central R. R. #4 at Bolivar, N. Y. Baldwin, 1881.



tion and Angelica as the Cannon Ball railroad. This section crossed the valley of Angelica Creek, about half a mile, on a wooden bridge supported by several high massive stone masonry piers, and while this section has been abandoned over forty years they are still standing in an excellent state of preservation.

In addition to the Cannon Ball the L. & P. operated three narrow gauge passenger trains daily between Olean and Angelica and two standard gauge trains between Angelica, Swains and Hornell. The company issued a very pretty illustrated time table entitled "The Glen Route," so named because of a popular summer resort called Stony Brook Glen which the railroad crossed on a high trestle.

Financial and legal difficulties harassed the road from its beginning and during the latter years of its life as the L. & P. it was operated by George D. Chapman of Angelica as receiver. He had been a minor official of the Scioto Valley Railroad and had come east to connect himself with the Allegany Central of which his brother, William O. Chapman, was superintendent. George became general superintendent upon the formation of the Lackawanna & Pittsburgh.

March 11, 1889 the property was sold at public auction, under foreclosure of mortgage, to a committee of purchase and reorganization.

ROCHESTER, HORNELLSVILLE & LACKAWANNA RAILROAD COMPANY. This company was organized June 9, 1886 by the interests behind the Lackawanna & Pittsburgh, and constructed a single track standard gauge line from a point which the railroad people called Hornellsville Junction to the village of Hornellsville, now the city of Hornell, with some track-age inside the municipality, in all about fourteen miles.

When construction was completed the road was leased to the Lackawanna & Pittsburgh, which lease was continued to the successor of the L. & P. When the latter company got into financial difficulties it threw the Rochester, Hornellsville & Lackawanna into receivership and the court appointed, September 8, 1890, Mitchell S. Blair* of Angelica to look after its interests.

The charter of this company, in addition to the line between Hornellsville Junction and Hornellsville, gave authority to construct from the latter point southerly seven miles to the village of Canisteo, but this additional construction was never attempted.

The line remained in litigation a number of years, when, upon the bankruptcy of the Lackawanna & Southwestern, it was sold at foreclosure and purchased by Charles Adsit and John Taylor Gouse who in turn conveyed the property to John Byrne and Frank Sullivan Smith, personally, president and vice president, respectively, of the Central New York & Western, by whom it was leased to the latter company. The

* Mr. Blair was born in Angelica in 1838. He was in the grain, feed and produce business and for many years was postmaster at Angelica. When the Allegany Central was built through to Angelica he became Auditor of the railroad; later was Auditor of the Lackawanna & Pittsburgh; then General Superintendent of the Lackawanna & Southwestern; then General Manager of the Central New York & Western. When the Pittsburgh, Shawmut & Northern was organized he retired from railway service. He died in 1902 and is buried in Angelica. He was a highly respected citizen.

interest of the John Byrne Estate was purchased by Mr. Smith in 1914. Upon Mr. Smith's death in November 1920 the property passed to his widow, Mrs. Clara A. Higgins Smith, a sister of Frank W. Higgins, former Governor of the State of New York. Mrs. Smith died March 17, 1934, since which time the property has been tied up in her estate. It is still operated under the old lease. If the Shawmut ever does come out of receivership and is reorganized, probably the Rochester, Hornellsville & Lackawanna will be merged into the new company.

LACKAWANNA & SOUTHWESTERN RAILROAD COMPANY. This company was incorporated May 7, 1889 as successor to the Lackawanna & Pittsburgh. It took over all the properties of the Lackawanna & Pittsburgh, including the lease of the Rochester, Hornellsville & Lackawanna, the lease of the Swains branch, and the trackage rights from Belfast Junction to Olean and from Wayland Junction to Wayland. John Byrne of New York City was elected president, with Frank Sullivan Smith of Angelica and Edward Mahoney of New York City as vice presidents. Evidently control of the property was now held in New York City.

Shortly after the formation of the Lackawanna & Southwestern the narrow gauge line from Bolivar to Angelica was discontinued, but the company retained title to the property, all service between Angelica and Olean passing over the standard gauge to Belfast Junction and the canal railroad to Olean. The narrow gauge from Olean to Bolivar remained in operation.

In October 1890 the Lackawanna & Southwestern abandoned the line from Angelica to Belfast Junction, cancelling the trackage rights from that point to Olean over the canal railroad, and the lease of the Swains Branch was automatically cancelled by the failure of the Lackawanna & Southwestern to operate it.

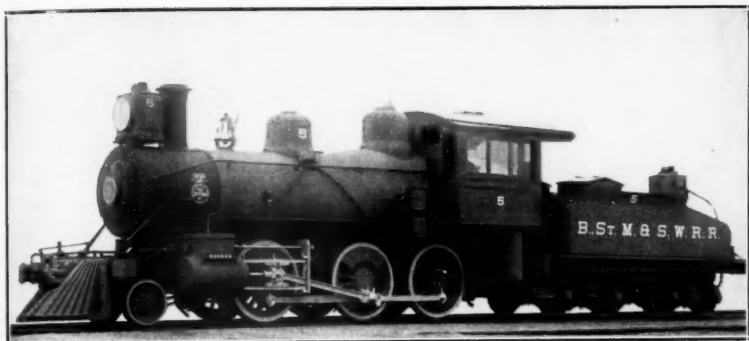
The company must have been in a very bad way. The narrow gauge line from Angelica had been torn up to Bolivar so that there was now no physical connection with the eighteen-mile line out of Olean. Financial difficulties probably were responsible. June 15, 1890 George D. Chapman was appointed receiver. October 12, 1890 the road ceased operations entirely, except for the narrow gauge line from Olean to Bolivar, and for several weeks there was no service. The property was sold under foreclosure September 24, 1892 to John Byrne and two months later he conveyed it to the

CENTRAL NEW YORK & WESTERN RAILROAD COMPANY. Incorporated November 18, 1892 as a reorganization of the bankrupt Lackawanna & Southwestern.

The company reported to the state authorities control of the following lines:

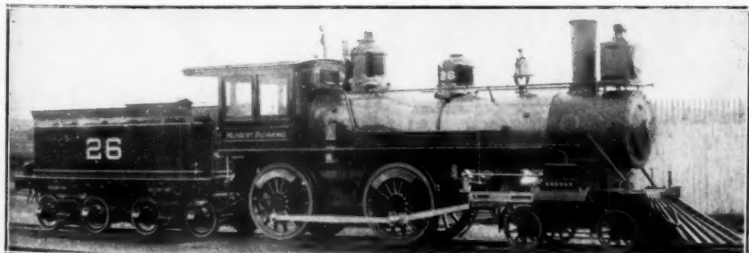
Olean to Angelica, narrow gauge	40 miles
Angelica to Wayland Junction, standard gauge	35 miles
Lease of Rochester, Hornellsville & Lackawanna, standard gauge	12 miles

That portion of the narrow gauge line from Bolivar to Angelica, twenty-two miles, was not in operation, which made a break in the com-



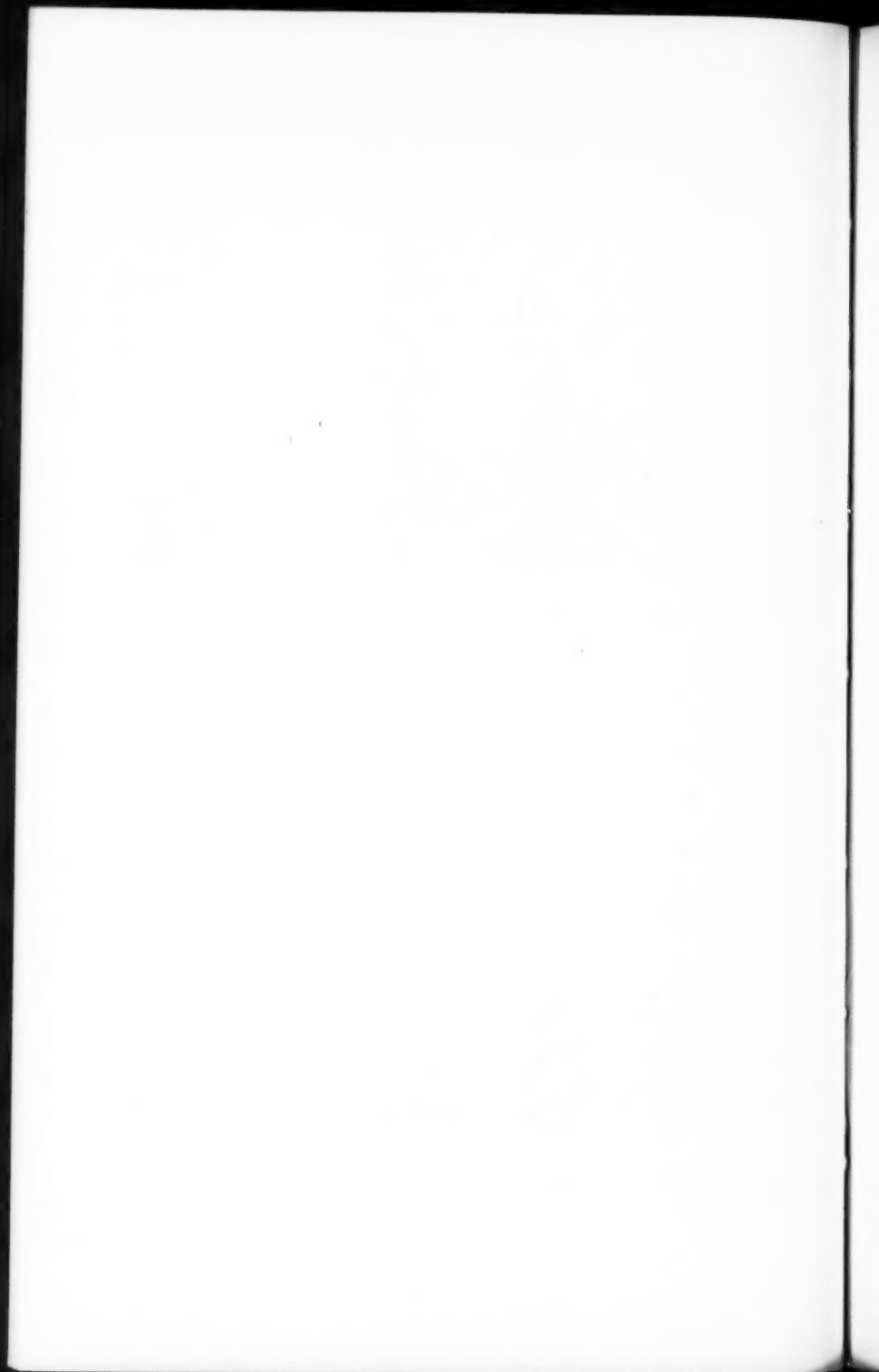
—Courtesy of the American Locomotive Company.

Originally Buffalo, St. Marys & Southwestern R. R. No. 5, becoming P. S. & N. No. 20. Brooks, 1897.



—Courtesy of American Locomotive Company.

Constructed for the Montgomery, Tuscaloosa & Memphis as its No. 26, "Herbert Richmond" but never delivered to that railroad, being shipped directly to the C. N. Y. & W. as its No. 1, becoming lastly P. S. & N. No. 13. Brooks, 1890.



pany's line. This state of affairs existed eleven years, each section being operated independently of the other.

John Byrne of New York City was president of the reorganized company, Frank Sullivan Smith was vice president, general offices at Angelica.

The company operated two passenger trains daily in each direction between Olean and Bolivar, three between Wayland and Hornellsville and two between Angelica and Hornellsville Junction.

It would be well to mention here the names of some of the officials of the Central New York & Western who remained with the line a great many years, through good times and bad. They were Lewis F. Wilson of New York City, secretary; Henry S. Hastings of Angelica, comptroller; William Barclay Parsons of New York City, chief engineer; Mitchell S. Blair of Angelica, general manager; Charles H. Hammond of Olean, general freight and passenger agent; Claire L. Lathrop of Angelica, superintendent of telegraph and signals; Bernard C. Mulhern of Hornell, superintendent. I believe that Mr. Lathrop is the only one now living. He commenced as a telegrapher with the Lackawanna & Pittsburgh in 1885 and is an official of the Shawmut today.

CENTRAL NEW YORK & NORTHERN RAILROAD COMPANY. This was a "paper" company, chartered April 20, 1899, and was formed as a subsidiary of the Central New York & Western for the purpose of constructing an extension from Wayland Junction northerly through the counties of Ontario and Wayne to a connection with the West Shore Railroad at Macedon, with a branch line from a Junction point at Canadice Lake to the village of Hemlock where a connection would be had with the Rochester branch of the Lehigh Valley. This project never advanced any further than the organization stage and no construction was ever attempted.

August 1, 1899 the Central New York & Northern was consolidated with the Central New York & Western under the latter name.

Lines in the State of Pennsylvania

THE PITTSBURGH, SHAWMUT & NORTHERN RAILROAD COMPANY OF PENNSYLVANIA was formed by the purchase, merger, consolidation and new construction of the following standard gauge railroads, all controlled by John Byrne and his associates:

1. **MOUNT JEWETT & SMETHPORT RAILROAD COMPANY**, organized May 27, 1892 and built from Mount Jewett to Gallup (now Kasson) 10.54 miles.

2. **ST. MARYS & SOUTH WESTERN RAILROAD COMPANY**, organized June 19, 1893, and built from St. Marys to Hyde, 20.64 miles.

3. **BUFFALO & ST. MARYS RAILROAD COMPANY**, organized June 5, 1895, and built from St. Marys to Clermont, 23.3 miles.

4. **EMPORIUM & MOUNT JEWETT RAILROAD COMPANY**, organized October 28, 1895, and built from Kasson to Clermont, 7.18 miles, but not entirely completed until 1902.

5. SMETHPORT & OLEAN RAILROAD COMPANY, organized December 5, 1895, and built from Smethport to Coryville, 7.47 miles, in 1900, and from Coryville to State Line, 11.2 miles, in 1910, under the title of the "State Line Branch." Previous to this latter construction the Shawmut had trackage rights over the Pennsylvania Railroad from Coryville to State Line and White House.

6. BUFFALO, ST. MARYS & SOUTHERN RAILROAD COMPANY, a consolidation, January 28, 1897, of the St. Marys & South Western and the Buffalo & St. Marys.

7. MOUNT JEWETT, CLERMONT & NORTHERN RAILROAD COMPANY, a consolidation, May 24, 1897, of the Mount Jewett & Smethport and the Emporium & Mount Jewett, and new construction from Kasson to Smethport.

8. KERSEY RAILROAD COMPANY, organized March 13, 1900, and built from Paine to Cardiff, 12.08 miles, opened in May 1901, and the Browns Run Branch of this road, Weedville to 42-Mine, 1.54 miles, in 1907.

9. MILL CREEK VALLEY RAILROAD COMPANY, organized June 8, 1899, to construct from Hyde to Erie Junction and Brockwayville, but as far as can be learned nothing was ever done under this charter, the company securing trackage rights over the Erie between these points.

10. PITTSBURGH, SHAWMUT & NORTHERN RAILROAD COMPANY OF PENNSYLVANIA, formed July 13, 1899, by consolidation, under the laws of Pennsylvania, of the Smethport & Olean, the Mount Jewett, Clermont & Northern, the Buffalo, St. Marys & Southwestern, the Mill Creek Valley and the Kersey railroad companies.

The Shawmut owned the Clarion River Railroad (organized December 17, 1892) which it purchased August 2, 1899, extending from Croyland to Hallton, twelve miles, and sold it to the Tionesta Valley Railway July 31, 1926.

Some of the short lines mentioned above which were in existence and operation before the final hook-up of the Shawmut system owned a few locomotives and these, with the exception of the Shay-gear type built by Lima, are included in the attached roster in so far as we have been able to find authentic records.

The Shawmut owns a short piece of track, 1.26 miles, from Shawmut to Drummond, which it built in 1902, and to reach this road it holds trackage rights over the Mead Run Branch of the Erie from Brockport to Shawmut, 2.41 miles. It also has trackage rights over the Toby Creek Branch of the Erie from Hyde to Brockwayville, 6.17 miles, where connection is made with its former ally, the Pittsburg & Shawmut.

When the Smethport & Olean was finally completed to the state line there remained a stretch in New York State, 2.20 miles, to connect up the lines in Pennsylvania and the lines in New York, and this was accomplished by the organization, August 1, 1899, of the SHAWMUT CONNECTING RAILROAD COMPANY, which constructed in 1902 from State Line to Olean Junction (now Prosser), and this subsidiary was merged into the P. S. & N. January 12, 1905.

Conclusion

The PITTSBURGH, SHAWMUT & NORTHERN RAILROAD COMPANY was incorporated in New York State August 2, 1899, as a reorganization and consolidation of the Central New York & Western and the Pittsburg, Shawmut & Northern of Pennsylvania, with John Byrne as president, being succeeded, in 1904, by his assistant, Frank Sullivan Smith, with an official family and Board of Directors much the same as the predecessor companies.

The following improvements were made:

The narrow gauge from Olean to Bolivar was made standard December 27, 1901.

The old narrow gauge line from Bolivar to Angelica, 22 miles, which had been unused almost twelve years, was practically all rebuilt in 1902-3, the right of way being relocated in many places, all standard.

Curves were improved, fills substituted for trestles, wooden bridges replaced by steel, ties renewed, heavier rail laid, and altogether the entire line was placed in first-class condition.

Thus a continuous through route, all standard gauge, was established from the coal fields of Pennsylvania to Wayland and Hornell.

The company's mileage at this time was shown as:

Northern Division, Wayland to State Line	70 miles
Southern Division, State Line to Brockwayville	86 miles
Olean Branch, Prosser to Olean	10 miles
Hornell Branch, Moraine to Hornellsville	11 miles
Mount Jewett Branch, Kasson to Mount Jewett	10 miles
Kersey Branch, Paine to Cardiff	12 miles
Clarion River Division, Croyland to Hallton	12 miles
Shawmut Branch, Shawmut to Drummond	14 miles
Together with trackage rights at Wayland, Brockport and Hyde.	

February 1, 1908 the P. S. & N. commenced operating under lease the Pittsburg & Shawmut Railroad, which runs southerly from Erie Junction and Brockwayville to Freeport, eighty-eight miles, tapping rich coal lands. Due to some misunderstandings between the parties to the lease it was terminated September 1, 1916, since which time the two companies have been operated independently of each other. The termination of this arrangement was most unfortunate for the P. S. & N., as it lost a large profitable coal traffic which the P. & S. now turns over to the Erie.

I have before me a public time table of the P. S. & N. issued in 1905. It is an attractive folder of nineteen pages with many illustrations of trains, bridges, depots, an excellent map and much interesting information about industries and activities along the company's railroad. The passenger service consisted of two trains daily between Hornell and Olean, two between Olean and Mount Jewett, one between Larabee and St. Marys, two between St. Marys and Brockwayville, one between Smethport and Mount Jewett and four on the Clarion River Division. The Olean branch had four locals, the Kersey branch two locals, and

four locals between Wayland and Hornell. There is a long list of special Sunday summer excursion trains to the Stony Brook Glen near Dansville and the Riverhurst amusement park outside of Olean.

In recent years small portions of one or two of the branches in Pennsylvania have been abandoned as the coal played out; otherwise the entire Shawmut system as shown in the mileage chart above is being operated today.

The connections are:

With the Erie at Wayland, Hornell, Swains, Friendship, Olean, Mount Jewett, Brockport, Hyde and Croyland.

With the Delaware, Lackawanna & Western at Wayland Junction.

With the Pennsylvania at Olean, Larabee, Smethport, Clermont, St. Marys, Brockwayville and Croyland.

With the Buffalo, Rochester & Pittsburgh, (B. & O.) at Mount Jewett, Brockwayville and Carman.

With the Pittsburg & Shawmut at Brockwayville.

There were connections at Belvedere with the Buffalo & Susquehanna before its abandonment north of Wellsville, at Ceres with the New York & Pennsylvania before its abandonment, and at Mount Jewett with the Bradford, Bordell & Kinzua and the Mount Jewett, Kinzua and Riterville before these last two lines were discontinued.

August 1, 1905, the company having defaulted in interest payment on its bonds, upon application of the Central Trust Company of New York, Frank Sullivan Smith was appointed receiver. November 15, 1920, Mr. Smith having died, Henry S. Hastings of St. Marys was appointed receiver. December 13, 1923 Mr. Hastings died and John D. Dickson of Wellsville, an attorney, was named receiver and he has operated the railroad since that time. The present company, therefore, has been in receivership over thirty-two years.

In addition to the rail lines the company controls the Shawmut Mining Company, the Shawmut Coal & Coke Company, the Shawmut Commercial Company, the Kersey Mining Company and large coal lands in Elk, Jefferson and Clearfield counties.

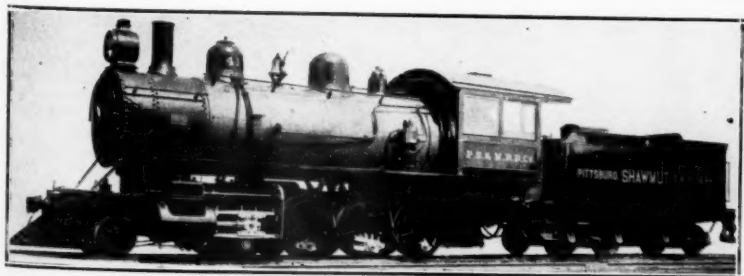
A map of The Shawmut Line is included in this article. By reference to it, the broken line from Wayland to Macedon is the proposed Central New York & Northern, the broken line from Brockwayville to Cool Spring is now part of the Pittsburg & Shawmut, while the broken line from Paine Junction to Caledonia was constructed under the charter of the Kersey Railroad Company. The map purports to show the entire Shawmut Line as projected, to extend from the coal fields of Jefferson County to Macedon, 250 miles.

For the past eight or ten years passenger service has been confined to a mixed train in each direction daily between Olean, Wayland and Hornell. This train also carried much expressage and mail which, sad to relate, was taken from the railroad a year or so ago and given to highway motor trucks. Because of this loss and little patronage by the public passenger service was discontinued January 5, 1938 and now



—Courtesy H. C. Meade.

"The Cannonball," Rochester, Hornellsville and Lackawanna R. R. #34.



—Courtesy of the American Locomotive Company.

P. S. & N. R. R. #41. Pittsburgh, 1899.

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there is not a coach run on the entire road. Freight traffic consists largely of coal, oil, paving blocks, bricks, fire clay, some lumber and manufactured goods and a miscellaneous assortment of general commodities. There seems to be a good volume of this tonnage moving, as every time I pass along the line—and my duties take me to that territory very often—I see plenty of freight trains, some double-headed with a third engine pushing. The engines are very old, as will be seen from the roster, and not capable of moving what modern power will haul, but they are kept in as good a condition as is possible consistent with the company's finances. The right of way is sufficiently maintained and the general offices at St. Marys and the branch offices at Angelica are well kept. Most of the depots have agents and telegraphers and the buildings are in good condition.

Locomotive Roster of the Pittsburg, Shawmut & Northern Railroad and its Predecessor Companies

Road Number	Builder	Year	Construction Shop No.	Type	Cylinders	Drivers	Original Company and Road Number	Remarks
1	Baldwin	1873	3125	2-6-0	11x16	36"	Cairo & St. Louis, "Monroe" No. 9	Note A. Scrapped about 1901
2	Mason	1881	652	2-4-4	10x16	42"	Allegany Central No. 1. Note C	Note A. Scrapped about 1901
3	Mt. Savage	1881	.....	4-4-0	12x18	44"	Friendship, "A. W. Miner", No. 1	Note A. Scrapped about 1901
4	Baldwin	1881	.....	4-4-0	.....	.....	Allegany Central No. 2	Note A. Scrapped about 1901
5	Baldwin	1881	5975	2-6-0	14x20	45"	Allegany Central No. 4	Note A. Scrapped about 1901
6	Baldwin	1881	5979	2-6-0	14x20	37"	Allegany Central No. 5	Note A. Scrapped about 1901
7	Baldwin	1881	.....	2-6-0	.....	.....	Allegany Central No. 6	Note A. Scrapped about 1901
8	Baldwin	1882	12974	2-4-4-T	16x24	56"	Allegany Central No. 7	Note A. Scrapped about 1901
9	Cooke	1886	1721	4-4-0	16x24	63"	Clarion River No. 2	Sold as scrap 12-31-1926
10	Brooks	1886	1726	4-4-0	16x24	63"	Lackawanna & Pittsburgh No. 32	Sold as scrap 12-31-1924
11	Brooks	1890	1564	4-4-0	17x24	62"	Roch., Hornell, & Lackawanna No. 34	Sold as scrap 12-31-1928
12	Brooks	1890	1655	4-4-0	17x24	63"	Cent. N. Y. & Western No. 2	Sold as scrap 12-31-1928
13	Brooks	1890	1656	4-4-0	17x24	63"	Cent. N. Y. & Western No. 5	Scrapped 11-25-1912
14	Brooks	1890	1563	4-4-0	17x24	62"	Cent. N. Y. & Western No. 6	Sold as scrap 12-31-1936
15	Cooke	1886	1727	4-6-0	18x24	55 1/2"	Cent. N. Y. & Western No. 1	Sold as scrap 12-31-1928
16	Baldwin	1886	1715	4-6-0	18x24	52 1/2"	Roch., Hornell, & Lackawanna No. 23	Sold as scrap 5-1-1916
17	Baldwin	1886	1715	4-6-0	18x24	52 1/2"	Lackawanna & Pittsburgh No. 21	Sold as scrap 5-27-1912
18	Dickson	1872	111	2-6-0	18x24	63"	P. S. & N. No. 15	Sold as scrap 12-31-1936
19	Dickson	1872	108	2-6-0	18x24	63"	P. S. & N. No. 16	Sold as scrap 12-31-1936
20	Brooks	1897	2739	2-6-0	18x26	63"	P. S. & N. No. 17	Sold as scrap 12-31-1916
21	Brooks	1897	2736	2-6-0	18x26	63"	Note D	Sold as scrap 9-22-1909
22	Baldwin	1903	21663	0-6-0	20x26	51"	Buffalo, St. Marys & S. W. No. 5	Sold as sc. 12-31-1928, Note E
23	Baldwin	1905	25712	0-6-0	20x26	51"	P. S. & N. No. 22	Sold as sc. 12-31-1924, Note E
	Cooke	1886	1722	4-4-0	15x22	.....	P. S. & N. No. 23	On active roster; in service
	Cooke	1886	1723	4-4-0	15x22	.....	Lackawanna & Pittsburgh No. 8	On active roster; in service
	Cooke	1886	1724	4-4-0	15x22	.....	Lackawanna & Pittsburgh No. 9	Note F
	Cooke	1886	1725	4-4-0	15x22	.....	Lackawanna & Pittsburgh No. 10	Note F
	Cooke	1886	1728	4-4-0	15x22	.....	Lackawanna & Pittsburgh No. 11	Note F
	Cooke	1886	1729	4-4-0	15x22	.....	Roch., Hornell, & Lackawanna No. 12	Note F
	Cooke	1886	1730	4-4-0	15x22	.....	Roch., Hornell, & Lackawanna No. 13	Note F
	Cooke	1886	1731	4-4-0	15x22	.....	Roch., Hornell, & Lackawanna No. 14	Note F
	Cooke	1886	1731	4-4-0	15x22	.....	Roch., Hornell, & Lackawanna No. 15	Note F
2nd 2	Baldwin	1899	1974	2-8-0	22x28	50"	P. S. & N. No. 40	Sold as scrap 12-31-1924
2nd 3	Baldwin	1899	1975	2-8-0	22x28	50"	P. S. & N. No. 41	Sold as scrap 12-31-1924
40	Pittsburgh	1899	.....	2-8-0	22x28	50"	P. S. & N. No. 42	Sold as scrap 12-31-1924
41	Pittsburgh	1899	.....	2-8-0	22x28	50"	P. S. & N. No. 43	Sold as scrap 12-31-1924

- Note C. As near as can be traced, this locomotive had been rebuilt before it arrived east, giving it the appearance of a new engine, and was probably Olean Railroad's No. 1. Whether it was purchased directly from the Cairo & St. Louis or from a dealer in second-hand railroad equipment has not been ascertained.
- Note D. Dickson Nos. 18 and 19 must have been purchased second-hand as they were both constructed long before the Shawmut was made standard gauge. The present records in the office of the Sup't of Motive Power omit the builder's construction numbers of these locomotives and their original railroads therefore cannot be traced.
- Note E. The Buffalo, St. Marys & Southwestern had a number of Shay-gear locomotives built by the Lima company. These were never used in main line service but evidently were numbered in the company's series.
- Note F. The eight Cooke engines of the year 1886 shown on this roster without road numbers had all been disposed of before the last renumbering and are not in the company's present records. Inasmuch as all the old files were destroyed in the fire which burned the mechanical department's offices there is now no way of finding out what disposition was made of them. Probably they were cut up for scrap.
- Note G. The Rochester, Hornellsville & Lackawanna locomotives were numbered in the Lackawanna & Pittsburgh series. The L. & P. kept the Alleghany Central numbers 1 to 7 for the narrow gauge engines and commenced with No. 8 for the standard gauge locomotives.
- Note H. During the course of the numerous changes in the corporate names of this railroad the older locomotives were renumbered four times. First, the L. & P.'s numbering; then renumbered by the L. & S. W.; again by the C. N. Y. & W., and lastly by the P. S. & N. in 1899. The road numbers shown on the above roster in the first column is the last renumbering and the series being used today.

The above roster was prepared with the assistance of Mr. H. W. McCullough, Chief Clerk to the Sup't of Motive Power of the P. S. & N. at St. Marys, Penna., Mr. J. Howard Wagar, Manager of the Photographic Department of the American Locomotive Company at Schenectady, N. Y., and Mr. Paul T. Warner of the Advertising Department of the Baldwin Locomotive Works at Eddystone, Pa., and to these gentlemen the writer is indebted for such completeness as has been attained. In view of several missing numbers it seems reasonable to assume that there were other engines on the road which are not included in this roster. However, with all the old records of the railroad company destroyed by fire, we have done the best we could.

Worth Reading

Compiled by

ELIZABETH O. CULLEN, *Reference Librarian, Bureau of Railway Economics, Association of American Railroads, Washington, D. C.*

Books and Pamphlets

The Canadian Pacific at War—On Land. . . On Sea. . . and In The Air. 16 pp. Illustrations. Maps. Published by Canadian Pacific Ry., Montreal, Canada, and available on request.

The First Passenger Railway (The Oystermouth or Swansea & Mumbles Line), by Charles E. Lee, with a Preface by Sidney Gareke. 91 pp. Illus., Maps. Published by The Railway Publishing Co., Ltd., London, England. 5 shillings. “. . . has retained its independence for 137 years. . .” p. 5.

Flying Freight, by L. K. Sillico, first vice president, The New York Air Brake Co., New York City. Cover-title, 41 pp. Illus. His address at Graduate School of Business Administration, Harvard University, December 15, 1942. “Air-Rail Comparative Capacity Performance” pp. 33-35. “Military Air Cargo” pp. 35-37. “Problems to be composed” pp. 37-39.

The History and Romance of Danville Junction or When Rails Were the Only Trails, by Cary Clive Burford, in collaboration with Guy Melvaine Smith. 304 pp. Illus. Published by Interstate Printers and Publishers, Danville, Illinois. Price not given.

The Louisville and Nashville Railroad 1850-1942, by Kincaid Herr. IX, 221 pp. Illustrations and Maps. Published by L. & N. Magazine, Louisville, Kentucky. Price not given.

The New London, Willimantic & Palmer Railroad Co.—A Brief History, compiled by Charles G. Woodward, Hartford, Conn. XV, 79 pp. Illustrations. “Chronology” [1847-1859], pp. v-x.

The Railroad Woman, by Margaret Talbot Stevens, associate editor, Baltimore & Ohio Magazine, Baltimore, Md. 19 pp. Address at Careers Conference, Indiana University, March 18, 1943. “Traditionally, rail-roading is a man’s job. It was 1855 before a woman was hired. She was Susan Morningstar, charwoman, the first woman whose name appears on any railroad’s payroll. . . (p. 1) The period between Susan Morningstar and Olive Dennis [Engineer of Service, B. & O. now] is marked by milestones in the progress of the railroad woman. . . (pp. 3-16) And now, some of you are wanting to know something how to go about getting into railroad work. . . There are two ways of getting an out-of-the-ordinary railroad position. . .” (pp. 16-18).

17 *The Railroads of Oklahoma*, by Preston George, engineer, Oklahoma State Highway Commission and Sylvan R. Wood, associate professor, Oklahoma Agricultural and Mechanical College. 80 pp. Illus. Maps. Published by Railway & Locomotive Historical Society as its Bulletin No. 60, January 1943. Price for members, \$1; for non-members, \$2. "Corporate history and construction records of railroads in Oklahoma" pp. 27-73. "Bibliography" p. 78.

Railway Engineering and Maintenance Cyclopedia—Fifth Edition—1942. An Authoritative Manual of Engineering, Maintenance and Signaling including Definitions, Descriptions, Illustrations and Methods of Use of the Materials, Equipment and Devices employed in the Construction and Maintenance of Tracks, Bridges, Buildings, Water Service, Signals and Other Fixed Railway Properties and Facilities. 1224 pp. incl. Illus., Diagrams, Tables. Published by Simmons-Boardman Publishing Corporation, Chicago and New York. \$5.00. Compiled and edited in co-operation with The American Railway Engineering Association and the Signal Section, Association of American Railroads.

The Steam Locomotive—Its Theory, Operation and Economics, including Comparisons with Diesel-Electric Locomotives, by Ralph P. Johnson, chief engineer, The Baldwin Locomotive Works. ix, 502 pp. including Illustrations, Diagrams, Formulae, Tables. Published by Simmons-Boardman Publishing Corporation, New York City. \$3.50.

Transport Goes to War—The Official Story of British Transport, 1939-1942, issued for the Ministry of War Transport by the Ministry of War Information. 81 pp. Illustrated. Published by H. M. Stationery Office, London, England. 1 shilling. "The Railwayman's War" pp. 44-50. Interesting side-lights on the subject are also in *Transport at War*, the address of the Minister of War Transport, Lord Leathers of Purfleet, before the Institute of Transport, November 3, 1942, who mentioned "My Department has been for the last eighteen months in charge both of the overseas transport and of the inland transport of this country." Lord Leathers' address is published in *Journal of the Institute of Transport*, January 1943, pp. 558-560.

Articles in Periodicals

Army Railroaders, by Henry B. Comstock. *Railroad Magazine*, February 1943, pp. 24-42. Illustrated. The U. S. Military Railway Service from its work in the Civil War to the "training program undertaken by the . . . Service, recently . . ."

["*Austerity*" *Locomotives: American*—described in *Railway Gazette*, London, England, December 11, 1942, p. 567; January 1, 1943, p. 1, and illustrated in issue of January 8, 1943, p. 44; *British*—described in *Railway Gazette*, October 17, 1942, p. 617, "The first of the 'Austerity' class of mixed-traffic locomotives. . ."; November 20, 1942, pp. 492-493,

with Illustration and Diagram, and Editorial commend: "Austerity" locomotives for posterity, p. 483; January 1, 1943, p. 8, "Sallon's impressions at Paddington"; January 22, 1943, p. 101, "... the first of the two-cylinder 2-8-0 locomotives. . ."; *German*—the "Series 50," 2-10-2 locomotive, also referred to as *Kriegslokomotive*—described in *Railway Gazette*, November 6, 1942, p. 449; December 4, 1942, pp. 546, 561. Illustrated.]

By Rail to Guatemala—With the Completion of the Suchiate Bridge, U. S. and Mexican Freight Cars Roll into the Tropics of Central America, by Wayne Lee. Illustrations by author. Map by Linn H. Westcott, pp. 32-33. Trains, April 1943, pp. 30-37. "... opened to traffic on November 1, 1942. . . Rushed to completion by Mexican engineers in about three months at a cost of \$65,000. . . Crossing over it is the standard gauge line of the Mexican National connecting at Ayutla with the three-foot rail of the International Railways of Central America, which operates in Guatemala, Salvador, and Honduras. . ." pp. 30, 35-36.

Electric, Steam or Diesel-Electric—An Outline of the Factors Involved in the Selection of Railroad Motive Power, by A. G. Oehler and H. C. Wilcox, associate editors, *Railway Age*, April 10, 1943, pp. 716-719. Abstract of their Factors Involved in the Selection of Railroad Motive Power, presented at the 1943 annual meeting, American Institute of Electrical Engineers, which will be published in full in the Institute's Transactions.

Handling Wartime Traffic, by W. C. Kendall, chairman, Car Service Division, Association of American Railroads. New England Railroad Club Proceedings, October 13, 1942, pp. 79-90. In the Discussion, pp. 90-93, Professor W. J. Cunningham observed: "Mr. President, Mr. Golden reminded me tonight that it was just 25 years ago, when I happened to be serving as president of this Club, that Mr. Kendall spoke to us on the same general subject. . . It is rather unusual to have a railroad veteran of the first World War serving in the same capacity during the present World War. Mr. Kendall has that distinction, and my own personal view is that a large part of the commendable record of the Association of American Railroads in the utilization of freight cars is creditable to the Chairman of the Car Service Division. . ." p. 90.

International Railway Associations, I-III. *Railway Gazette*, December 4, 1942, pp. 549-550; December 11, 1942, p. 575; December 18 & 25, 1942, pp. 606-607. Brief histories of Berne Conventions; International Transport Committee; International Technical Standards Conferences; International Wagon Union (R. I. V.); and International Carriages & Vans Union, in I; European Timetable Conference; European Goods Train Timetable Conference; International Union for the Issue of Through Tickets, and International Containers Bureau, in II; International Railway Congress Association; League of Nations Communications Section; International Railways Union (U. I. C.); Union of Central European Railway Associations; Eastern European Change of

Gauge Associations; East European Group of the International Railways Union; Northern Railways Officials Association; International Rail Congress, and International Tariff Associations, in III. Reprinted as pamphlet by Railway Gazette. 24 pp. 2 shillings.

Little Railroads Pull a Big War Load; 500 "Short Lines" Feed Freight to Main Lines—Road in Arkansas (3 Miles) Hauls Bauxite; Oregon One (62 Miles) Carries Lumber—Serves 12,000 Communities, by Robert Laffan. Wall Street Journal, February 24, 1943, pp. 1, 3.

Microphotographing Railroad Records, by B. H. Moore, valuation assistant and accountant, AAR, Washington, D. C. American Railway Engineering Association Bulletin 436, January 1943, pp. 389-392. "The war has abruptly changed the usual considerations given to the selection of a suitable place for the storage and preservation of records which accumulate in the ordinary conduct of a business enterprise. . . Now, particularly along our seaboard cities, proper protection must be given against sudden and complete destruction by bombings and shell fire. The use of microphotograph offers itself as one of the best and possibly the cheapest form of insurance. . ." p. 389.

Navy Gets Rail from 116 Miles of Historic Line—Closure in the first transcontinental route, around Great Salt Lake, Utah, yields more than 14,000 tons of usable materials for war purposes. Railway Age, February 20, 1943, pp. 398-400. Map, p. 398. Illustrated. "Out in the desert area of Utah, where 74 years ago men raced under difficulties to bring to a closure the first transcontinental railroad of the country, primarily as a national defense measure, other men have been racing in recent months under nearly equal difficulties to take up part of that same railroad, long since relegated to a secondary line by a cut-off [Lucin cut-off], to make the track materials available in a new period of national crisis. The line involved is the single-track Promontory line of the Southern Pacific around the north end of Great Salt Lake. . . Beyond the historic significance of the Promontory line as the closing link in the first transcontinental railroad is the interesting fact that on this line construction records were established which still stand today. . ." p. 398.

The New Syrian Railway—An Army-Built Standard Gauge Link between Haifa and Tripoli. The line is of strategic importance. . . Railway Gazette, January 1, 1943, pp. 10-11. Maps and Illustrations. ". . . it was completed in nine months by engineers from Africa, Australia, and New Zealand, employing 3,000 men working in 24-hour shifts and using materials from India, Burma, the U. S. A., and Turkey. . ."

Progress in Railway Mechanical Engineering, 1941-1942, by ASME Railroad Division Committee RR 6, Survey. Its Annual report to ASME annual meeting, New York, November 30-December 4, 1942. Illustrated. Mechanical Engineering, January 1943, pp. 21-30.

Railroad Men in This and Other Wars, by Carl R. Gray, Jr., Brigadier-General, U. S. Army, General Manager, U. S. Military Railway Service. The Western Railway Club, Chicago, Ill., Official Proceedings, October 1942, pp. 13-26.

Railway Age—A. R. E. A. Convention and Exhibit in Print—N. R. A. A. Number—March 20, 1943. Its Vol. 114: 541-606 and adv. pp. 1-74. Illustrated. "... For the first time in 43 years, the American Railway Engineering Association will not hold an annual convention. . . Likewise, for the fourth time since 1908, there will be no annual exhibit of the National Railway Appliances Association. In the absence of a convention and exhibit, the Railway Age presents this special section. . ." p. 549.

Railway Age—Annual Statistical and Outlook Number, January 2, 1943. Its Vol. 114: 1-152, including Illustrations and Tables and adv. pp. 1-172. "Huge Job Done—Harder One Ahead" by Joseph B. Eastman, director, ODT, pp. 5-6. "War Traffic's Exigencies Are Met" by Charles Layng, transportation editor, pp. 23-25. "Railroads Prepare for Post-war Era. A. A. R. Sponsoring Comprehensive Research Program. . ." by Walter J. Taft, Washington editor, pp. 43-45, 72. "1942 Railway Operations Reviewed" by Dr. Julius H. Parmelee, director, Bureau of Railway Economics, AAR, pp. 59-72.

Railway Mechanical Engineer—Coordinated Mechanical Associations' "Convention in Print" Number, November 1942. Its Vol. 116: 445-510, Illustrated, and adv. pp. 1-88, illustrated partly in color carrying out theme of number. "Why Conventions in Print?" p. 445. *Master Boiler Makers' Association—Reports.* . . pp. 446-461. *Locomotive Maintenance Officers' Association—reports.* . . pp. 470-478, 494. *Railway Fuel and Traveling Engineers' Association—Reports.* . . pp. 479-495.

Railway Purchases and Stores—Railway Executives Number, January 1943. Its Vol. 36: 1-100, Illustrated, and adv. pp. 1-138. "Let's Keep Our Perspective" p. 1. "Importance of Transportation Recognized" p. 1. China a Factor in Post War U. S. Railroad Rehabilitation," pp. 1-2.

Railway Signaling—Convention in Print and Signaling in War Issue, November 1942. Its Vol. 35: 568-652, incl. adv. pp. Illustrated. *Signaling in War Section,* pp. 595-607. *Convention in Print Section,* pp. 608-622. *Exhibit in Print Section,* pp. 623-647.

Railways in Free China. Railway Gazette, January 15, 1943, pp. 73-74. "... Noteworthy in the present railway construction is the fact that most of the motive power, rolling stock, rails, and sleepers have been taken from the enemy. . . Meanwhile, China is also making use of its highways and cross-country routes, and 33 national animal transport routes are in constant use connecting Chungking with fifteen provinces. . . Officials in Chungking report that 65,000 pack animals (including ponies, burros, and camels), 60,000 carts and 20,000 junks, are being used. . ."

Some Unexplored Fields in American Railroad History, by Henrietta M. Larsen, Harvard University. Bulletin of The Business Historical Society, Inc., Boston, Mass., October 1942, pp. 69-78.

[*Speed Surveys*].—[1] *American Railway Speed in 1942*, by Cecil J. Allen. Railway Gazette, February 12, 1943, pp. 166-168. Tables. [2] *Annual Speed Survey [1942]*, by Donald Steffee. Railroad Magazine, March 1943, pp. 10-25. Illustrations and Tables.

The Western Desert Railway—A standard-gauge line of strategic importance, built to Mersa Matrouh before the war as part of the plan for the defence of Egypt, and now extended to Tobruk in Cirenaica. Railway Gazette, February 5, 1943, pp. 139-144. Maps, Profile, Illustrations. "... With our present advance into Libya, the whole railway has been in Allied hands, once more, since the re-occupation of Tobruk on November 13 last. . ." p. 144.

New Books

"The Boomer," by Harry Bedwell, 318 pages, 7½x5. Bound in cloth. Published by Farrar & Rinehart, Inc., New York, N. Y. Price \$2.00.

Eddie Sands, boomer, is not new to the readers of Railroad Magazine and those of us who have enjoyed his exploits and adventures will be glad to have them in book form.

Our hero, as many will recall, is a boomer operator. As he travels over the country he finds many an adventure. He is a real railroad man and a real boomer and although his exploits incur the wrath of some of the minor officials he retains a clear service record.

Now it is true that "Eddie" never saves the runaway train bearing the president's daughter, thereby giving him perhaps, the opportunity of marrying the girl and "papa" giving him a soft job for life nor does he ever save some valuable shipment by means of gun play. His adventures easily "might have been" and for this reason, if no other, they appeal to this critic.

The author knows his railroad and has shown it throughout the book. He has woven the work and duties, adventures if you will, of a boomer operator with considerable human nature, as found on and off the railroad and has succeeded with great skill. Humor is mixed with pathos, it should be for that is life, yet underlying it all are the sturdy convictions of our hero who is in every sense, a true railroad man.

Good railroad fiction, in book form, is none too plentiful and this book easily deserves a place in that field. It is a book that young and old, can and will enjoy.

"Reveille in Washington, 1860-1865," by Margaret Leech, 483 pages with index, illustrated, 9¼x6½. Bound in cloth. Published by Harper & Brothers, New York, N. Y. Price \$3.50.

This is a story of Washington, its men and its women, during the Civil War. Washington, enjoying a leisurely existence at the outbreak of hostilities becomes a border town—to be defended by the North, a great prize for the South. Almost over night it becomes an armed camp, to remain so for four years. On its stage come soldiers, relatives, foreign adventurers, crooks, politicians, reporters, spies and harlots. Generals come and go. Only one succeeded—U. S. Grant.

While it is true that some mention is made of the railroads either entering or in the vicinity of Washington, the book is not reviewed in our publication for that purpose. It is a story of Washington, not its railroads.

Upon the outbreak of any war, the capitals of the warring nations absorb an influx of population such as the author has described. It was so then, it is probably true today. Washington, so close to the border of hostilities occupied a somewhat peculiar and dangerous position.

Certainly, had the Confederates known of the true conditions after first Bull Run they could easily have captured our capital. That they did not was our good fortune; not to capable military leadership. One questions the genius of McClellan—his failure to attack.

The book, drawn from contemporary accounts, is a valuable addition to our national history. In it there is much to ponder over and consider. Fortunate was the North to have such soldiers as Grant, Sherman and Sheridan to match strategy against Lee and Jackson and fortunate were we to have Lincoln in the White House at this time. Unfortunate for the Nation, both North and South was his assassination for the reconstruction period after a war, we know now to be fully as important as winning a war.

With a map of Washington for 1861, a good biographical index and a good general index this book becomes a valuable reference book. It is one that all true Americans should read in order to have a clearer insight to the struggle through which this Nation survived over eighty years ago.

"The Louisville and Nashville Railroad, 1850-1942," by Kincaid Herr, 221 pages with index, illustrated, 11 $\frac{1}{4}$ x8 $\frac{3}{8}$. Published by The Louisville & Nashville R. R., Louisville, Kentucky. Bound in cloth. Price \$1.00. Copies may be obtained from Mr. Thomas E. Owen, Editor, Louisville & Nashville R. R. Magazine, Louisville, Ky.

Late in 1938 there appeared in the L. & N. Magazine the first installment of the history of the L. & N. R. R. which continued well into 1942. With commendable foresight, the type and cuts were preserved and thus we have this history in book form.

The L. & N. is nearly one hundred years old. October 27th, 1859 was the date of the first special train to connect those two southern cities. Then came the war in which the road played an important part in carrying northern troops and their supplies. Feeling ran high in Kentucky—its population was divided between the north and south.

With the close of the war came a period of expansion. Roads extending to Birmingham, Montgomery and Memphis, in the coal and iron region, were absorbed; then those leading to New Orleans and St. Louis together with smaller roads in Kentucky and thus the system continued to grow and expand until it reached its present size.

Many capable men have held important positions on this road—Mr. Milton H. Smith, President, 1884-1886 and 1891-1921 and Mr. Albert Fink, Construction Engineer, General Superintendent and Vice President. No one who examines the annual reports of this road can help but admire the care and completeness of detail with which they were prepared, thanks to Mr. Fink. They excel those of any railroad in this country and sound accounting principles were adopted long before those of the I. C. C. were enforced.

Conservatively managed, shrewdly if you wish, no road was acquired just for the sake of complete domination of a section. There

was a period of sizing up; to see how the road would fit into the picture and if it would produce sufficient tonnage to make it an asset and not a liability. Grades have been reduced, curves have been eased and the property has been maintained to a high standard. From Winchester, Ky., to Newport, Ky., that double-track portion of the L. & N's. Cincinnati to Atlanta line, over which there is a very heavy movement of coal from the Eastern Kentucky fields, it is all down hill toward the Ohio River!

The L. & N. continued building locomotives in its South Louisville Shops as late as 1905. Many engines have been built there since the "Southern Belle" made her appearance in 1871. Good design, careful construction and honest maintenance have always been the watchwords of the Motive Power Department.

The L. & N. has weathered many financial storms. It has never changed its corporate name and it is one of the very few railroads that have never been in the hands of a receiver. It has always met its obligations to the public, paid every dollar to its workers, its creditors and its stockholders, with the exception of a few years, have received dividends continuously since 1864. Truly the road has won the affectionate name—"The Old Reliable."

And truly we can state that this book is well worth this modest sum, replete in history, illustrations and a good index.

Arthur Curran

Arthur was born in New York City, August 27th, 1885. His home was a short distance from the tracks that led to the Grand Central Station and from one of the overhead bridges, sometimes in the company of Grandfather Ambler but more often by himself, he was wont to observe the trains of both the New York Central and New Haven roads entering that city. He attended Columbia University and for a short time was connected with the Rogers Locomotive Works of Paterson, N. J. After a short period of being employed in a bank, he turned to writing and continued in this field until his death. He was on the staff of the old "Railroad Man's Magazine" and after that discontinued publication he was a free lance writer, his articles appearing in various newspapers and magazines. Ill health forced him to leave New York City in 1919 and after spending a year in Rutland, Vermont, he came to Newton Centre, Massachusetts. Death came almost instantly, a cerebral hemorrhage on March 1st, last.

For nearly thirty years your Editor enjoyed the friendship and fellowship of Arthur Curran. Acquaintance began when he lived in Philadelphia, making the sojourn to New York over the week-end and the visits to his home were renewed when both came to New England. During these years we had our differences of opinion but this never marred our friendship. If he was a good entertainer, he was also a good listener.

Arthur Curran's profound knowledge was not only based on a study of the subject of locomotives and railroads but on a trained and keen sense of observation. It was his good fortune to have travelled extensively throughout the Mid-west, North-west and some of Canada—all prior to 1910. As a boy, the Buchanan engines on the New York Central and the Henney engines of the New Haven were in their prime. He observed their performance as they brought their trains in and out of Grand Central. Encouraged by his father, during these trips, he visited stations and engine terminals and there observed the locomotives—bottle green on the Grand Trunk, chocolate brown on the Adirondack & St. Lawrence. Whatever he saw he remembered and precious little he ever forgot. His memory was truly remarkable.

He was a great observer of detail and could tell almost from a glance at either the locomotive or a photograph, the builder. Cabs, boiler mountings, bell stands were all carefully catalogued in his retentive memory. Few men that I know have this ability. It is one that our students might well follow. If our late member, Inglis Stuart was a keen student and an authority on the early locomotives, Arthur certainly was an authority on our later day and modern locomotives.

When Warren Jacobs and your Editor conceived this Society they went to Arthur Curran for consultation. Here they found one willing to help, both with time and money and he was the first Recording Secretary. Although inclined to be a bit of a recluse in later years, per-

haps owing to his health, no one ever lacked a warm welcome in his hospitable home from either him or his wife. Many a pipe of good tobacco has been smoked, not only by your Editor but by others, in his comfortable home. Much has been discussed during these visits and much has been learned in these years. Arthur had no favorite road or pet locomotive builder, but he, in common with many of us, did admire a handsomely proportioned locomotive through sheer simplicity of design.

The pipe is out and the fountain pen will no longer be directed by those fingers and that active brain. A light snow fell the night before the funeral, blanketing New England in pure white. Here, around the big curve at Weston Park on the Boston & Albany, where he was wont to observe the trains, over the snow clad Charlton hill and through the lower Connecticut valley, he has made his last trip home!

Clarence J. Allen

Word comes of the passing of another of our members in Milwaukee, Wisconsin. A graduate of Princeton University in the Class of 1886, he was employed by the Pennsylvania R. R. in their Altoona Shops. In 1899 he went to Milwaukee and was employed by the Chicago, Milwaukee & St. Paul R. R. in the famous Milwaukee Shops. In 1902, with Mr. Beverly Worden, he founded the Worden-Allen Co., a structural steel plant, retiring from the presidency of that concern ten or twelve years ago.

He took great interest in outdoor life and was considered one of the foremost amateur ornithologists in Wisconsin. For nearly forty years he made a trip each spring in order that he might study the migration of the birds.

Many of our members enjoyed his friendship, the stories of his experiences and his intimate knowledge of the railroad. Like the majority of us, he had a genuine love for the steam locomotive.

Death came after a short illness on January 25th last, at the age of 77 and his passing will be felt by all of his friends.

In Memory Of

EDWIN R. CLARK
Life Member
Chelmsford, Massachusetts,
who died on January 20th, 1943.

FRED A. GILMORE
Annual Member
2331 Cathedral Ave., N. W., Washington, D. C.
who died in September, 1942.

J. S. HOBSON
Annual Member
People's Gas Bldg., Chicago, Illinois,
who died in August, 1942.

CAPT. G. O. ISBESTER
Annual Member
548 Railway Exchange, Chicago, Illinois,
who died in September, 1942.

WILLIAM H. WANZER
Annual Member
25 Bay View St., Burlington, Vermont,
who died on April 23rd, 1942.

HENRY A. L. WOODCOCK
Annual Member
1 Morgan Terrace, New Bedford, Mass.,
who died on March 13, 1941.

